Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 1

Contents

Product Name & Specifications

1. Product Name
2. Precautions
3. Features
4. Component Names
5. General Specifications
6. Retrieving Bills
7. Cabling
8. Outside Dimensions
9. Country Codes

Issue 01/2006

JAPAN CASHMACHINE CO., LTD.

Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

1. Product Name (Model Name + Type)

EBA product name constitutes two kinds; [MODEL] name and [TYPE] .
As for (1) to (6), refer to the description of the optional items.

[MODEL] EBA - 3* - SD3 (EBA - 3*)
(1) (1)

[TYPE] *** - * * * * - **
(2) (3) (4) (5) (6) (7)

JCM provides optional items for this model. Please consult JCM sales representatives for details.

(1) Type of CPU board
Two types of CPU boards (Flash-ROM or EP-ROM) are available.
0: DC12V Flash-ROM type board for ID-003/MDB interface (Standard)
1: DC12V EP-ROM type board for ID-003/MDB interface
2: DC12V Flash-ROM type board for ID-003/ccTalk/HII Interface (Standard)
3: DC12V EP-ROM type board for ID-003/ccTalk/HII Interface
4: DC12V/DC24V Flash-ROM type board for ID-003/MDB interface (Standard)
5: DC12V/DC24V EP-ROM type board ID-003/MDB interface

(2) The country code corresponding to acceptable banknotes: 3-digit code under ISO3166 shall be used. Refer to the country codes on page 1-11.

(3) Cash Box type
0: Without box (stackerless model)
4: 400-note capacity (Standard)
6: 600-note capacity (To be developed)

(4) Faceplate
0: Without faceplate (Standard)
1: With faceplate

(5) I/F conversion board
0: Without I/F conversion board (Standard)
1: With Type A I/F conversion board (For serial-to-parallel conversion. To be developed)

(6) Key Switch
0: Without Key Switch (Standard)
1: With Key Switch
2: With Key Switch (for User A)

(7) Interface protocol ID

03:	ID-003	JCM serial interface
D3:	ID-0D3	MDB interface
E3:	ID-0E3	ccTalk interface (Note 1)
F3:	ID-0F3	HII interface (Note 2)
**:	Others	The last two digits of interface ID are assigned.

Example: **EBA-30-SD3-CZE-4000-03**
EBA-30 model bill acceptor with standard SD3 stacker box, Czech software, no faceplate, no I/D conversion board, no key switch, ID-003 I/F.

Note 1) "ccTalk" is a serial communication protocol provided by Money Controls.
Note 2) "HII" is a serial communication protocol provided by Mars Electronics International.

2. Precautions

(1) Do not insert a torn, folded, or wet bill, as this may cause bill jam inside the unit.

(2) Do not expose the unit to water.
The unit contains several precision electronic devices which can be damaged if water or any liquid is sprayed or spilled into the unit.

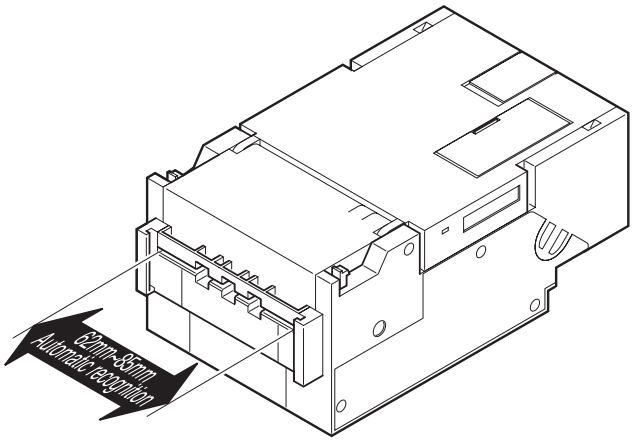
(3) Do not install the unit in a dusty environment. Dust may affect the sensor performance.

3. Features

EBA-3X-SD3 provides the following features:

3-1 Automatic centering

Automatic centering mechanism allows the unit to read bills ranging from 62mm to 85mm without using bill guides (side blocks). Bill acceptance rate and security against counterfeits have been greatly improved.

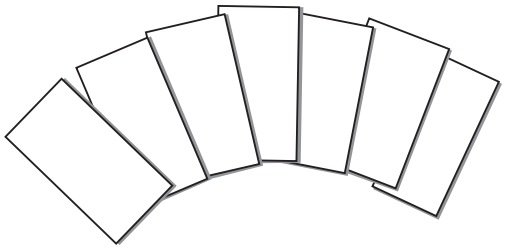


3-2 Automatic Re-validation

The EBA-3x series features automatic re-validation. The unit attempts to accept bill three times in total, if the bill is rejected in the first insertion.

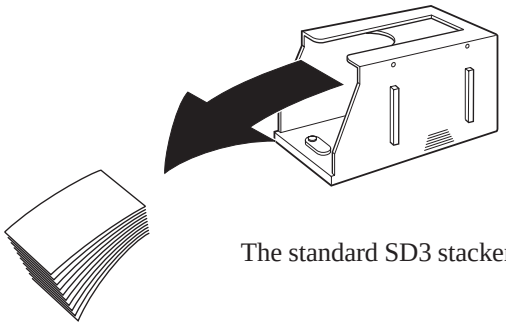
3-3 Dip switch settings to accept/reject bills

Accept/reject of each denomination is DIP switch selectable.



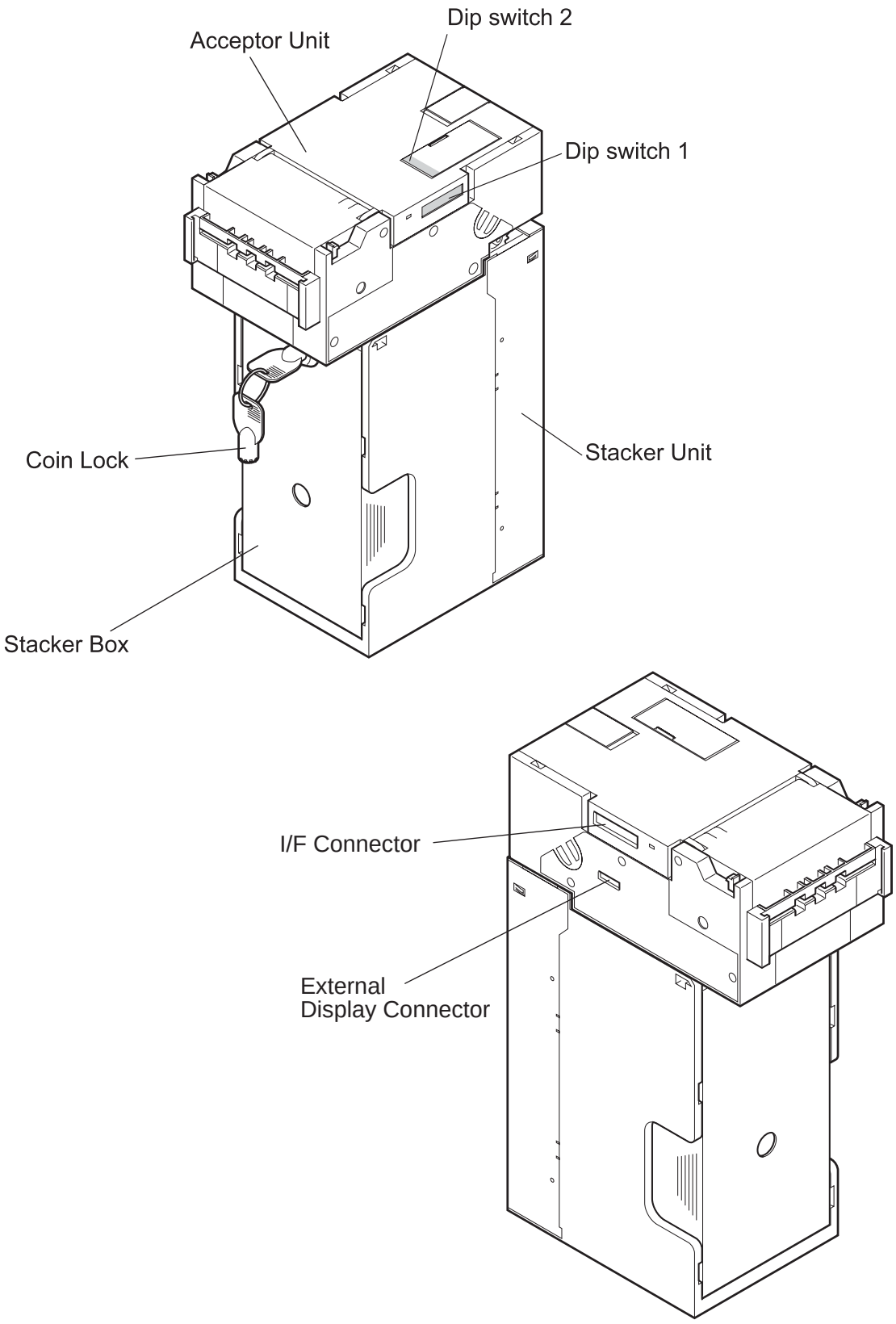
3-4 Easy bill retrieval

The stacker box can be detached from the stacker unit to withdraw deposited bills.
The stacker box is equipped with a coin lock for higher security.



The standard SD3 stacker box stores up to 400 bills.

4. Component Names



5. General Specifications

5-1	Size of Banknotes	Width: 62 to 85 mm, Length: 120 to 160 mm
5-2	No. of Denominations	Up to 32 denominations [Refer to "Data Setting Specifications" of each software]
5-3	Directions	4 ways (Longitudinal insertion) (The directions may vary depending on the software specifications.) [Refer to "Data Setting Specifications" of each software]
5-4	Acceptance Rate	95% or more (Including bills accepted in two retries. The following bill is excluded:) (1) Bill with stain, wear, wetness, tear or remarkable wrinkles (2) Bill with folded corner or edge (3) Bill with incorrect cut dimensions or improper alignment in printing
5-5	Processing Speed	Approx. 2 seconds for validation. Approx. 5 seconds for stacking (with SD3 stacker) For a head unit without SD3 stacker, it takes approx. 3 seconds from acceptance to ejection.
5-6	Interface	(1) TTL serial interface (2) MDB interface (3) ccTalk / HII interface (4) Parallel interface Should be connected to an optional I/F conversion board.
5-7	Stacker Box	(1) Capacity Approx. 400 bills (2) Access Front Access
5-8	Escrow	1 Bill
5-9	Indication	(1) The validator operating status is indicated by three LEDs (green, red and orange) on CPU board. Green LED: This LED lights during idling and bill-accepting operation. When a bill is rejected, the LED blinks to indicate the rejecting status (see Chapter 6, 6-11/12). Red LED: This LED blinks when an error is detected. The error status is indicated by the number of blinks (see Chapter 6, 6-11). Orange LED: This LED lights when the guides of bill centering mechanism are at the home position. While the LED is on, the head unit can be opened. (2) External display output (7-pin connector) When this connector is connected to the optional display unit, the acceptor's operating status is displayed. ON: The unit is able to accept bills. OFF: The unit is unable to accept bills.

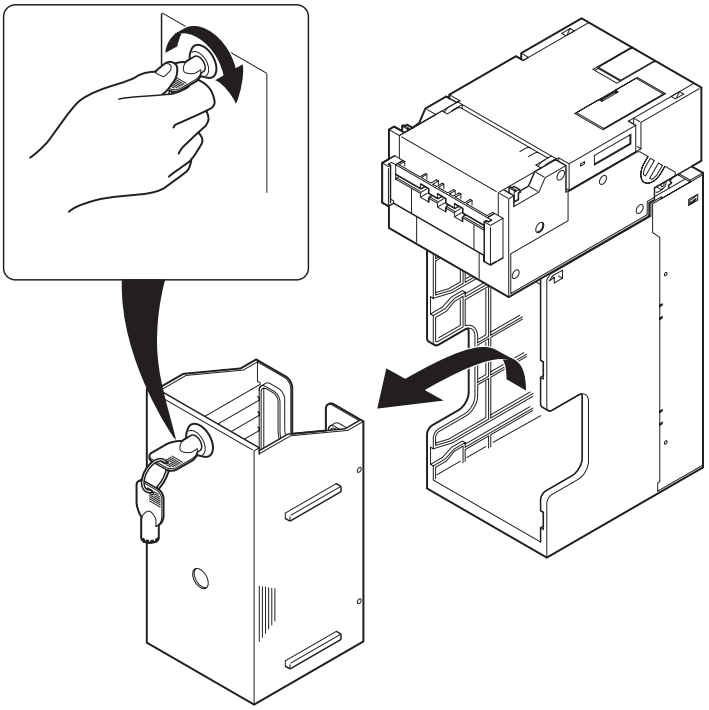
5-10 Power Supply Voltage	12 VDC ± 5% (EBA-30/31/32/33/34/35) (Use a power supply with 3A or higher capacity.) 24VDC ± 10% (EBA-34/35) (Use a power supply with 1.6A or higher capacity.)
5-11 Current Consumption	12VDC (1) In standby: 0.3A (2) During operation: 1.6A (3A max.) 24VDC (1) In standby: 0.2A (2) During operation: 0.9A (1.6A max.)
5-12 Operating Environment	(1) Operating temperature: 5 to 50° C (2) Storing temperature: -20 to 60° C (3) Relative humidity: 30 to 85% (no condensation) (4) Installation: Install the unit indoors where it is not exposed to direct sunlight.
5-13 Outer Dimensions	Refer to the outline drawings for the configuration with SD3 stacker, and without the stacker.
5-14 Weight	(1) With SD3 stacker Approx. 2.5 kg (2) Without SD3 stacker Approx. 1.0 kg
5-15 Mounting	Horizontal mounting Earthe the the sheet metal part of the unit

[NOTE] Unless otherwise specified, the general specifications of the EBA-3x series are measured based on the following conditions:

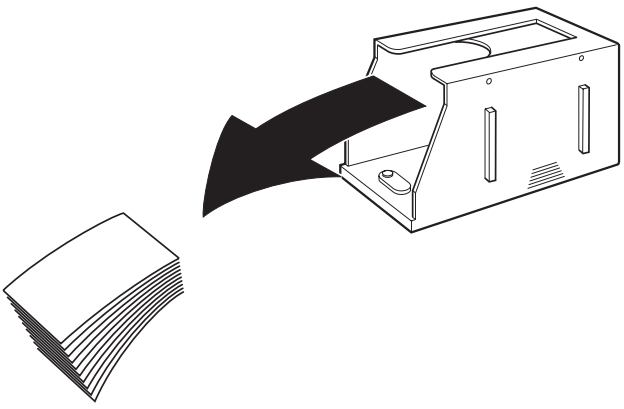
(1) Power supply voltage: 12 VDC ± 0.1 V (19.9 to 12.1 V)
24VDC ± 0.2 V (23.8 to 24.2V)
(2) Temperature: 25 °C ± 3 °C (22 to 28 °C)
(3) Relative humidity 40 to 65%
(4) Standard bill 20 Euro bill

6. Retrieving Bills

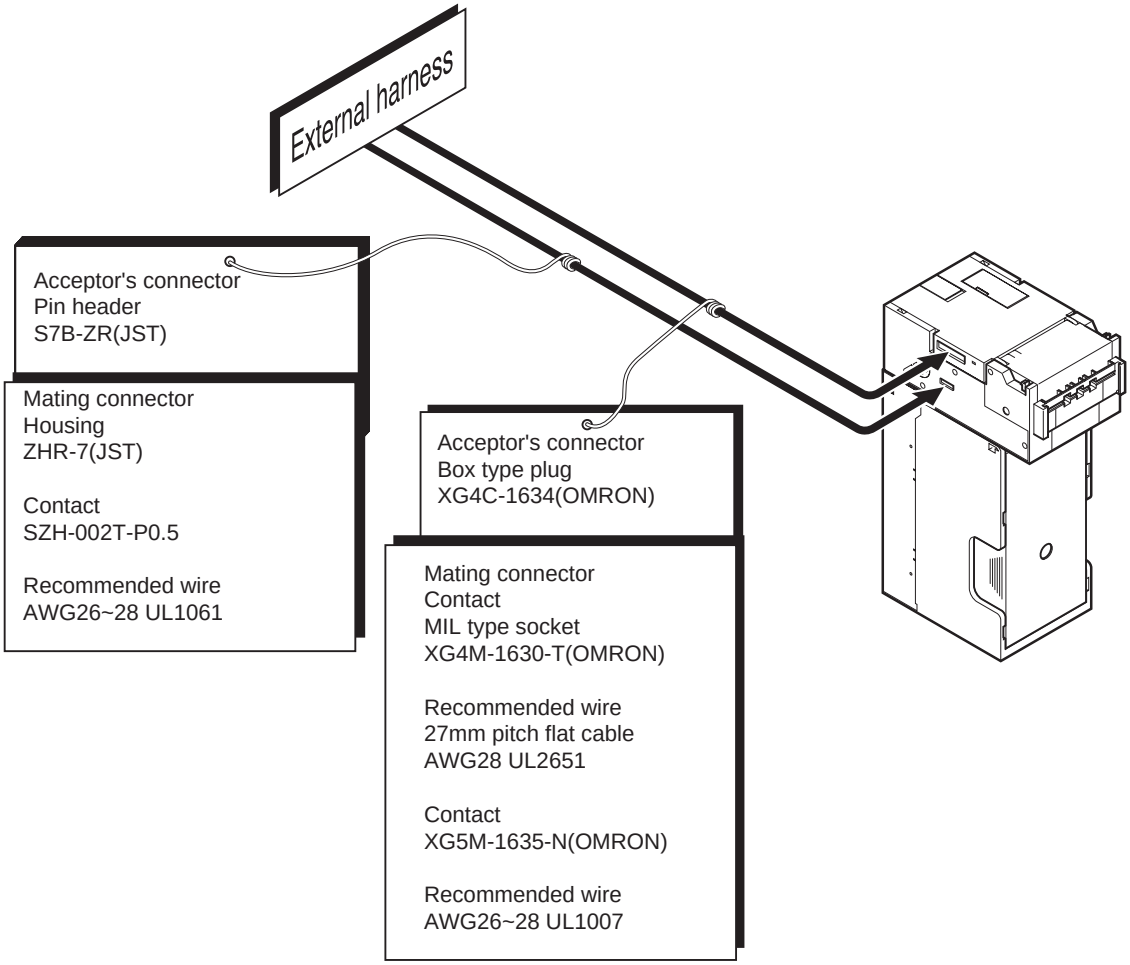
(1) Unlock the stacker box and pull it out from the stacker unit.



(2) Retrieve the bills.

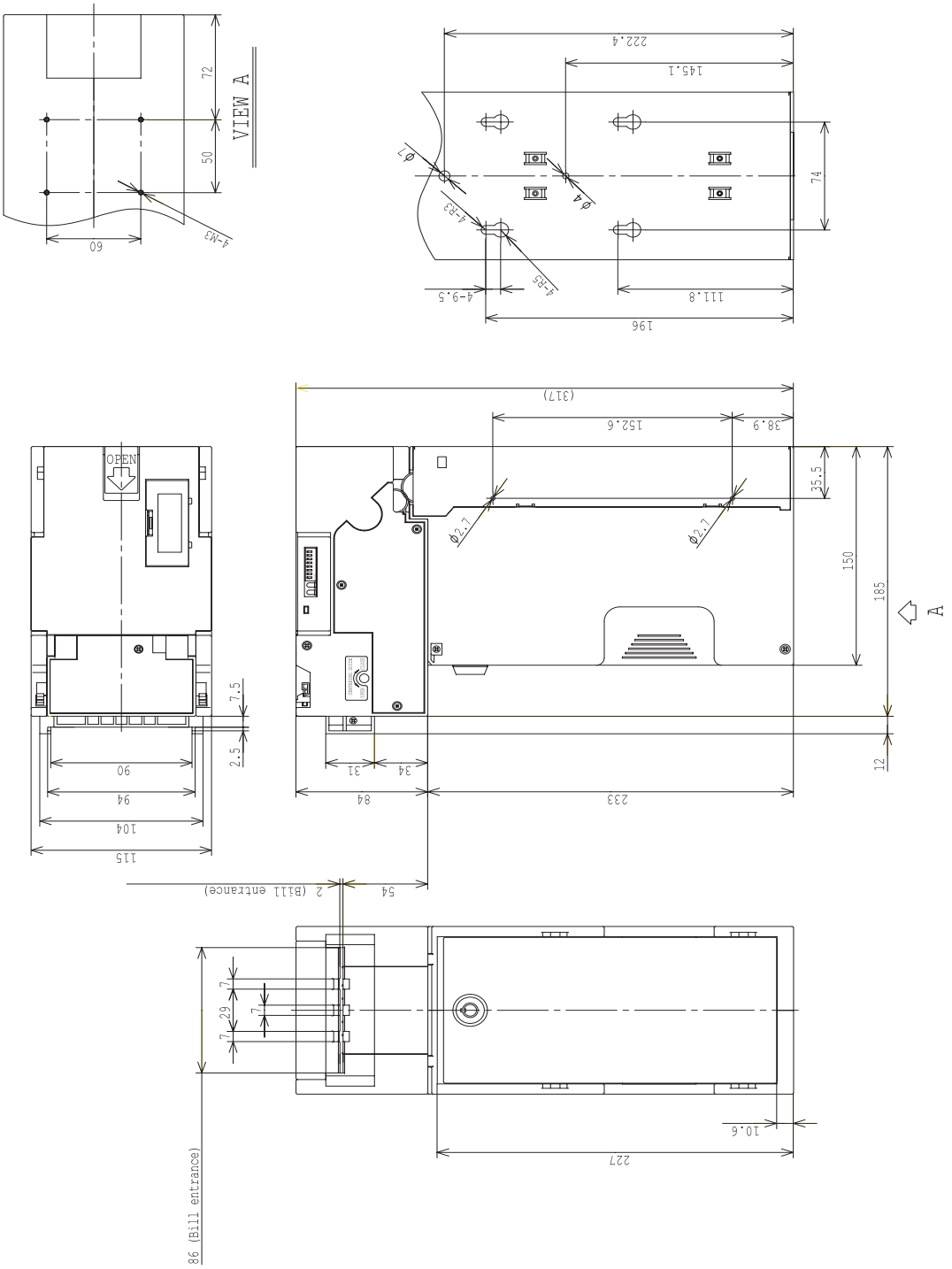


7. Cabling

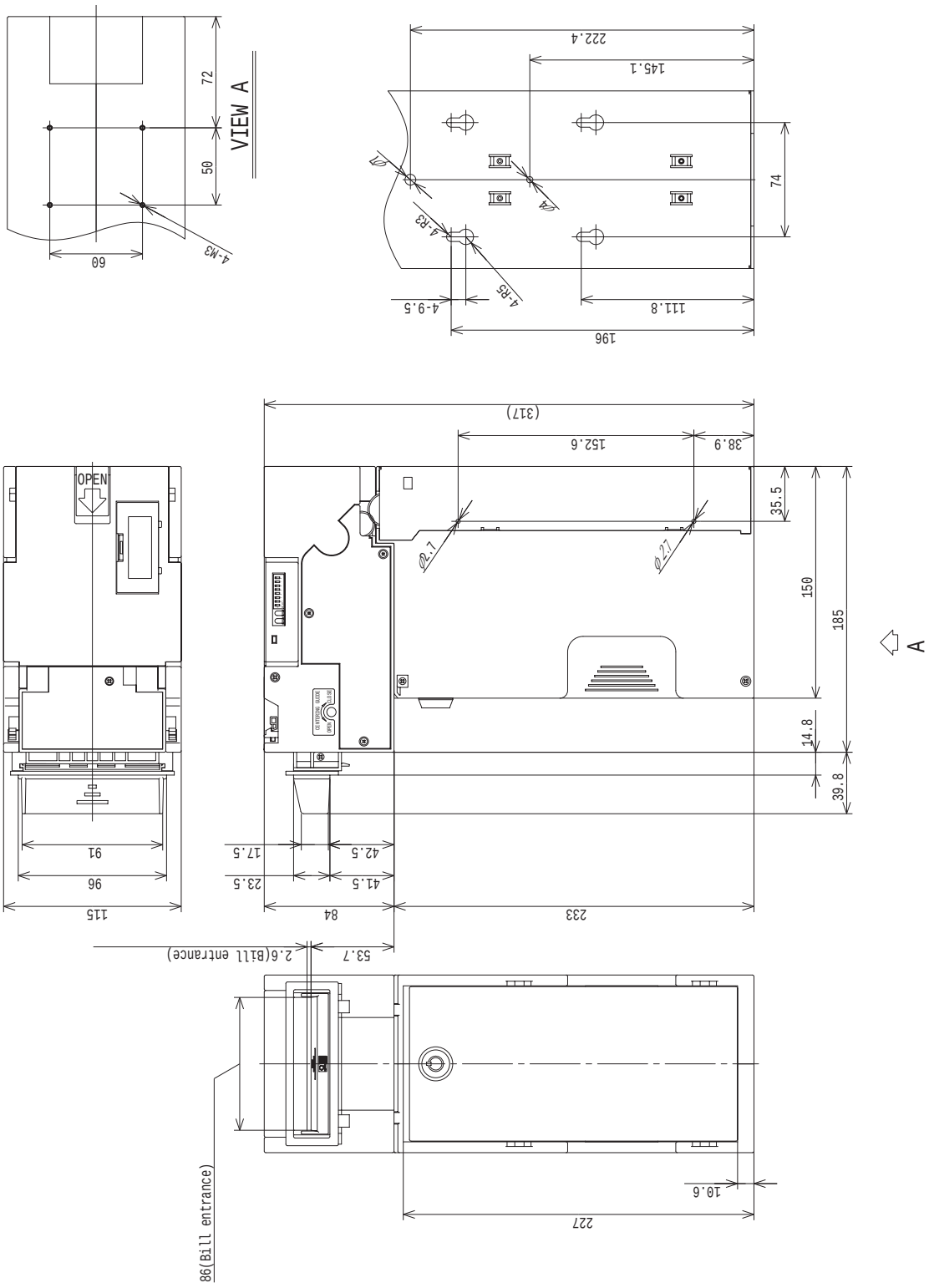

External harness
Acceptor's connector
Pin header
S7B-ZR(JST)
Mating connector
Housing
ZHR-7(JST)
Contact
SZH-002T-P0.5
Recommended wire
AWG26~28 UL1061
Acceptor's connector
Box type plug
XG4C-1634(OMRON)
Mating connector
Contact
MIL type socket
XG4M-1630-T(OMRON)
Recommended wire
27mm pitch flat cable
AWG28 UL2651
Contact
XG5M-1635-N(OMRON)
Recommended wire
AWG26~28 UL1007

8. Outside Dimensions

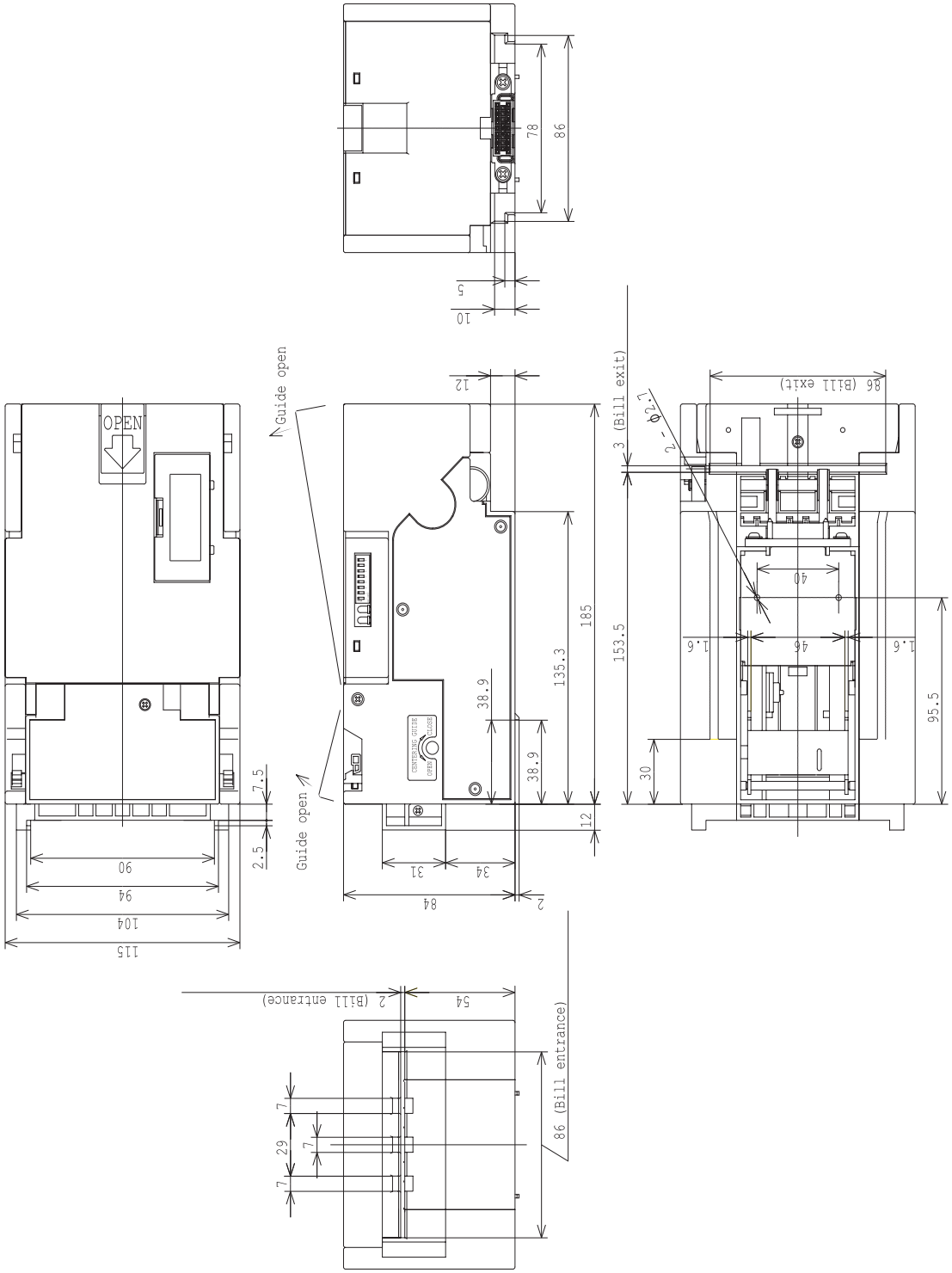
8-1 EBA-3x-SD3 without faceplate



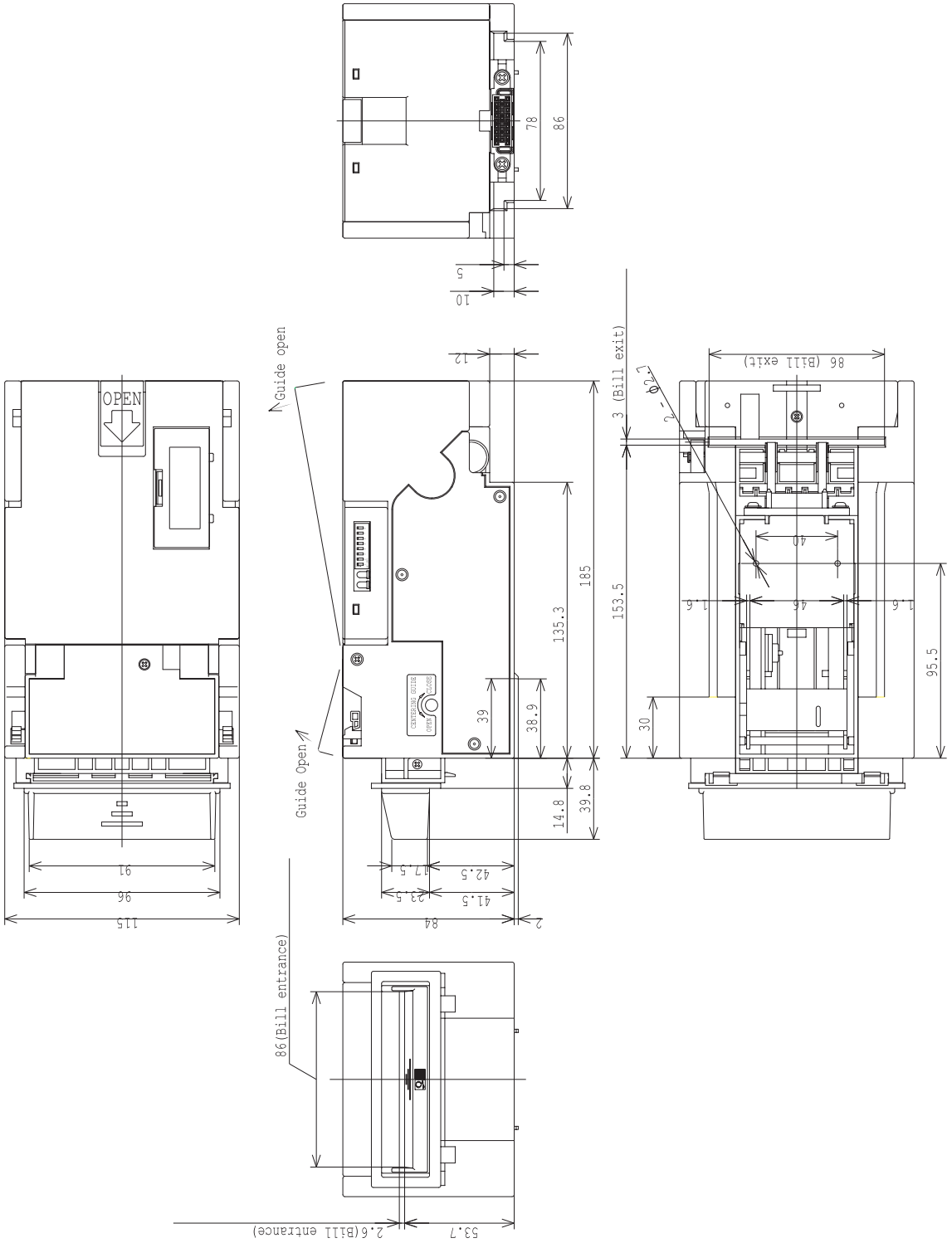
8-2 EBA-3x-SD3 with faceplate



8-2 EBA-3x without faceplate



8-2 EBA-3x with faceplate



9. Country Codes

Country	Country Code
Antilles	ANT
Argentine	ARG
Australia	AUS
Austria	AUT
Austria	AUT4
Barbados	BRB
Belgium	BEL
Botswana	BWA
Brazil	BRA
Bulgaria	BGR
Canada	CAN
Canada	CAN
Chile	CHL
China	CHN
Colombia	COL
Costa Rica	CRI
Croatia	HRV
Cyprus	CYP
Czech Republic	CZE
Denmark	DNK
Estonia	EST
Estonia	EST2
European Union	EUR
Finland	FIN
France	FRA
Germany	DEU
Germany	DEU1
Germany	DEU2
Germany/Sweden	DEU/SWE
Great Britain (England)	GBR
Great Britain (England)	GBR-B
Great Britain/Gibraltar	GBR/GBI
Great Britain/Isle Of Man	GBR/MAN
Greece	GRC
Greece	GRC-B
Guatemala	MGT
Honduras	HND
Hong Kong	HKG
Hungary	HUN
Iceland	ISL
India	IND
Israel	ISR
Italy	ITA
Italy	ITA8
Italy	ITA9
Japan	JPN
Kazakhstan	KAZ
Kazakhstan	KAZ1
Latvia	LVA
Lithuania	LTU
Malaysia	MYS
Malaysia	MYS1
Malta	MLT
Mauritius	MUS

Country	Country Code
Mexico	MEX
Moldova	MDA
Morocco	MAR
Namibia	NAM
Netherlands	NLD
Netherlands	NLD-B
New Zealand	NZL
New Zealand	NZL1
New Zealand	NZL-B
North Ireland	NIRL
Norway	NOR
Norway	NOR1
Peru	PER
Peru	PER1
Philippines	PHL
Philippines	PHL1
Poland	POL
Poland	POL1
Poland	POL1-B
Portugal	PRT
Qatar	QAT
Republic Of Ireland	IRL
Republic Of Korea	KOR
Republic Of Korea	KOR-B
Romania	ROM
Russia	RUS
Russia	RUS-B
Saudi Arabia	SAU
Singapore	SGP
Singapore	SGP-B
Slovakia	SVK
Slovenia	SVN
South Africa	ZAF
Spain	ESP
Sri Lanka	LKA
Sweden	SWE
Switzerland	CHE
Switzerland	CHE3
Switzerland	CHE-B
Taiwan (Republic Of China)	TWN
Tanzania	TZA
Thailand	THA
Trinidad & Tobago	TTO
Ukraine	UKR
Ukraine	UKR1
United Arab Emirates	ARE
United States	USA
United States	USA
United States	USA
Uruguay	URY
Uruguay	URY1
Venezuela	VEN
Venezuela	VEN1
Venezuela	VEN2
Venezuela	VEN-B

Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 2

Contents

Operation and Maintenance

1. Installation
2. Interface
3. External Connection Circuit
4. Pin Assignment
5. Connector
6. Description of DIP switches
7. Operational Flow
8. Clearing Bill Jam
9. Clearing / Preventive Maintenance

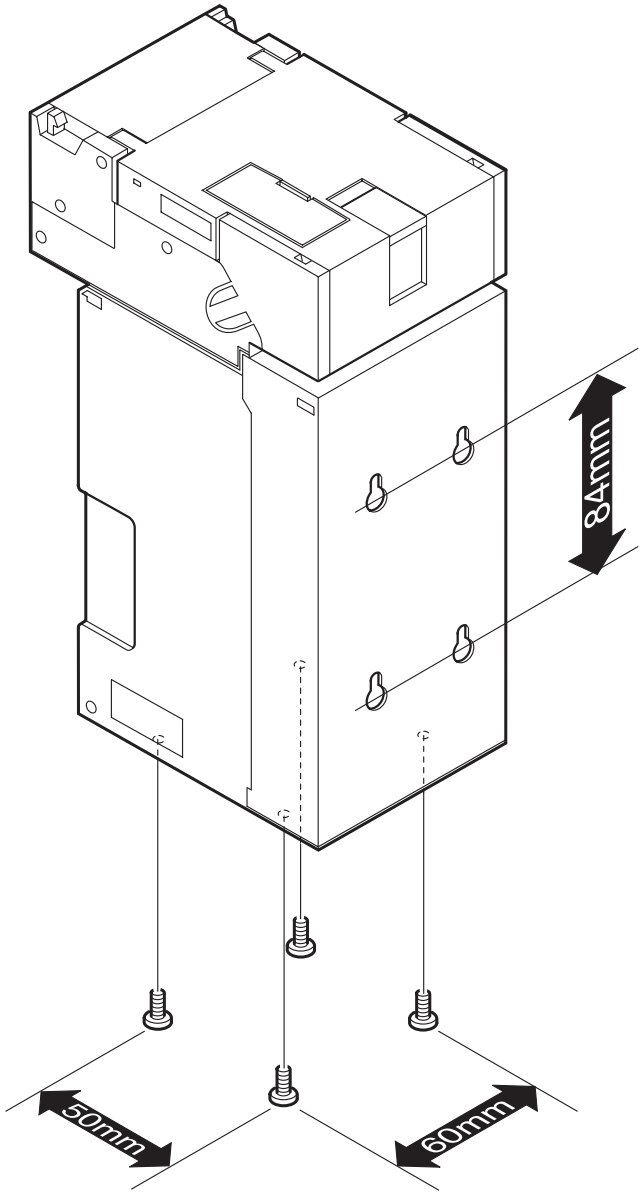
Issue 11/2006

JAPAN CASHMACHINE CO., LTD.

Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

1. Installation

There are 8 installation holes in total on the rear and the bottom of the unit.



2. Interface

2-1 Outline of interface

The following interface are available in the EBA-3x series.

- ID-001 parallel interface (EBA-30/31 + Type A I/F conversion board)
- ID-003 JCM serial interface (EBA-30/31/32/33/34/35)
- ID-0D3 MDB interface (EBA-30/31/34/35)
- ID-0E3 ccTalk interface (EBA-32/33)
- ID-0F3 HII interface (EBA-32/33)
- ID-0** Other interface

2-2 ID-003 JCM serial interface

ID-003 is JCM bidirectional serial interface that enables acceptor status/operation control and functional setup/verification by using polling (STATUS REQUEST) and commands (OPERATION COMMAND and SETTING COMMAND) from the controller.
For communication specifications, refer to Chapter 3 "ID-003 Communication Specifications".
For denomination and vend code settings, refer to "ID-003 Data Setting Specifications of each software".

2-3 ID-0D3 MDB interface

ID-0D3 is the MDB interface mainly used for vending machines.

2-4 ID-0E3 ccTalk serial interface

ID-0E3 is the serial interface provided by Money Control.
For communication specifications, refer to "Money Control: ccTalk Specifications".

2-5 ID-0F3 HII serial interface

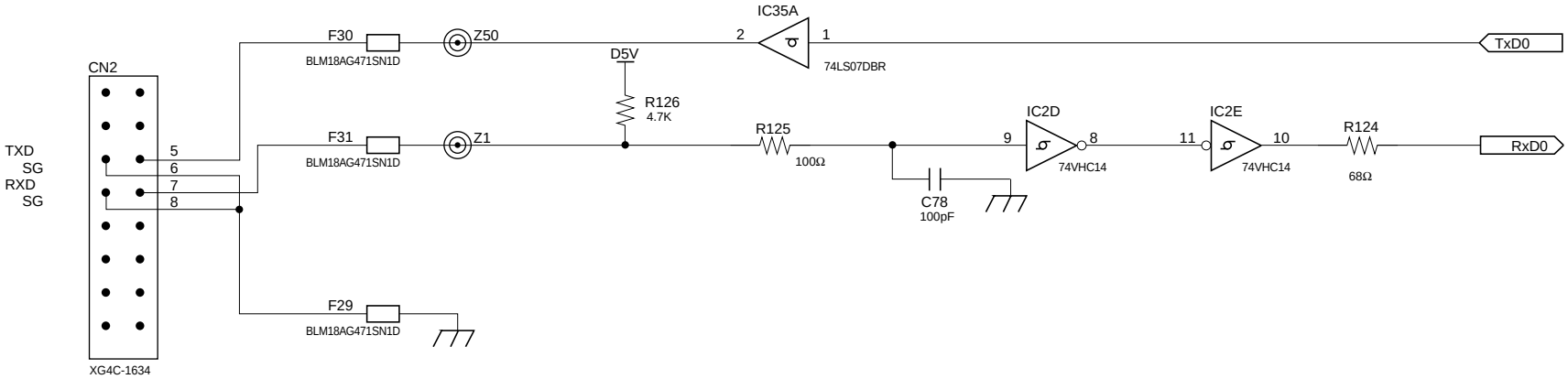
ID-0F3 is the Host Intelligent Interface provided by Mars Electronics International (ID-0F3 interface is to be supported).

2-6 Other interface

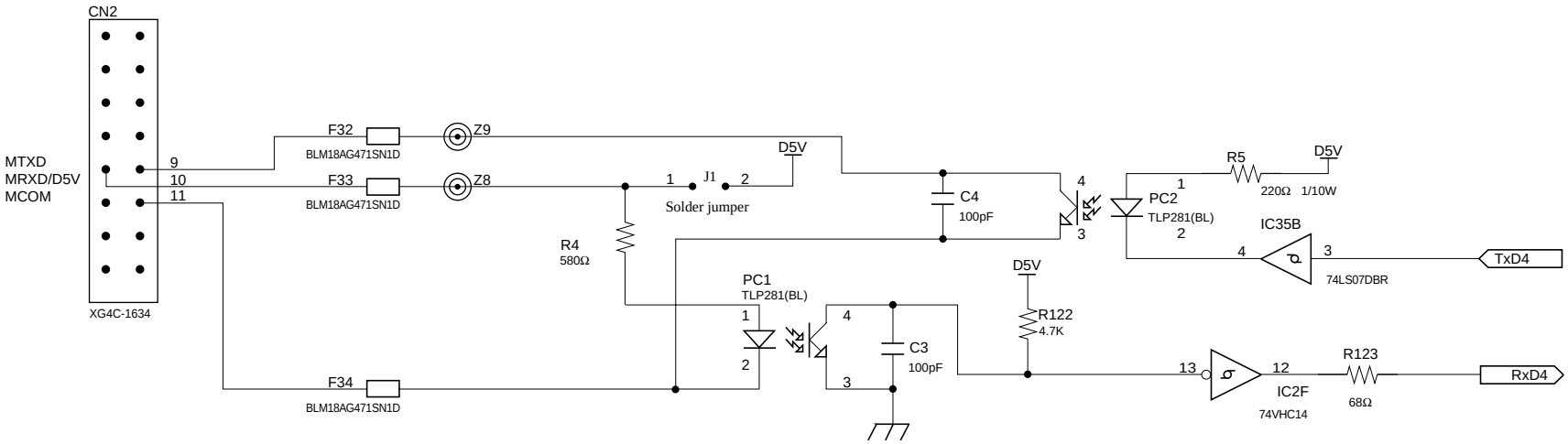
ID-001 JCM parallel interface is to be supported with the use of type A I/F conversion board.

3-1. External Connection Circuit (EBA-30/31/34/35)

3-1-1 ID-003 Interface Circuit

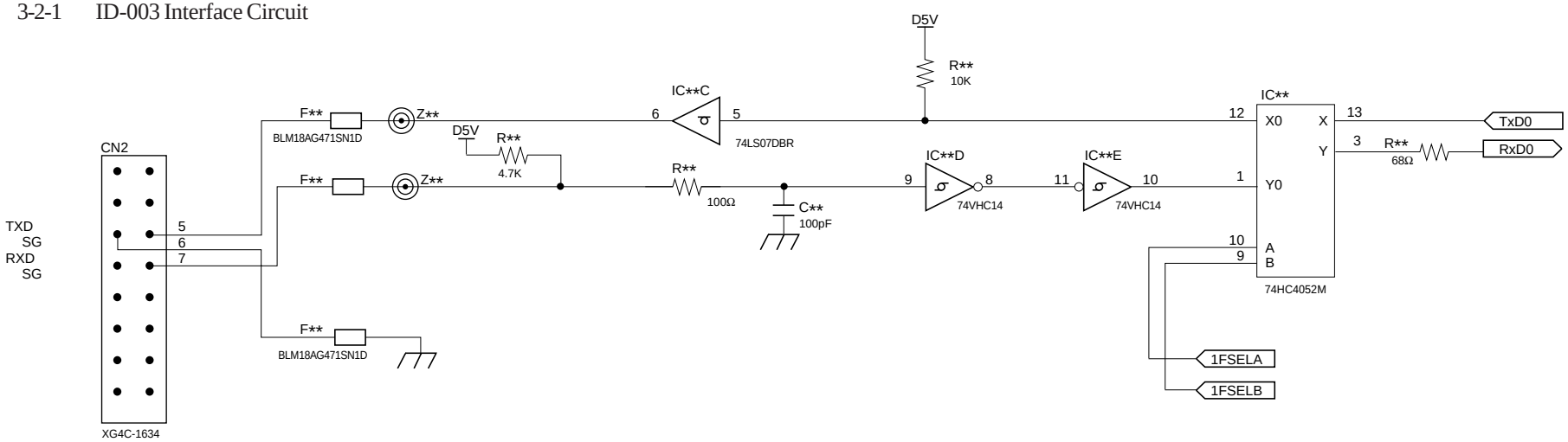


3-1-2 ID-0D3 (MDB) Interface Circuit

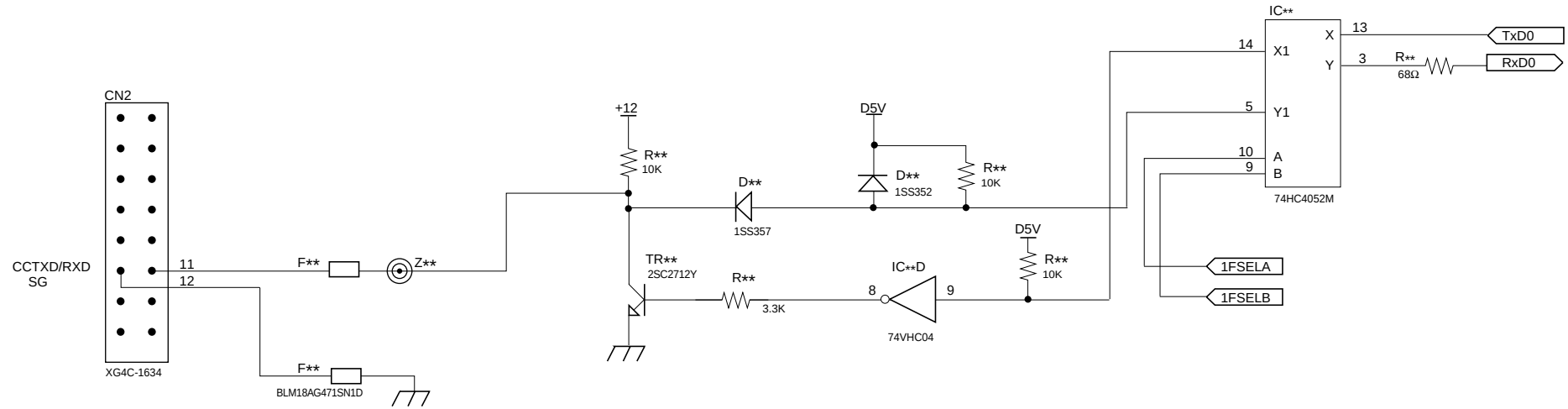


3-2 External Connection Circuit (EBA-32/33)

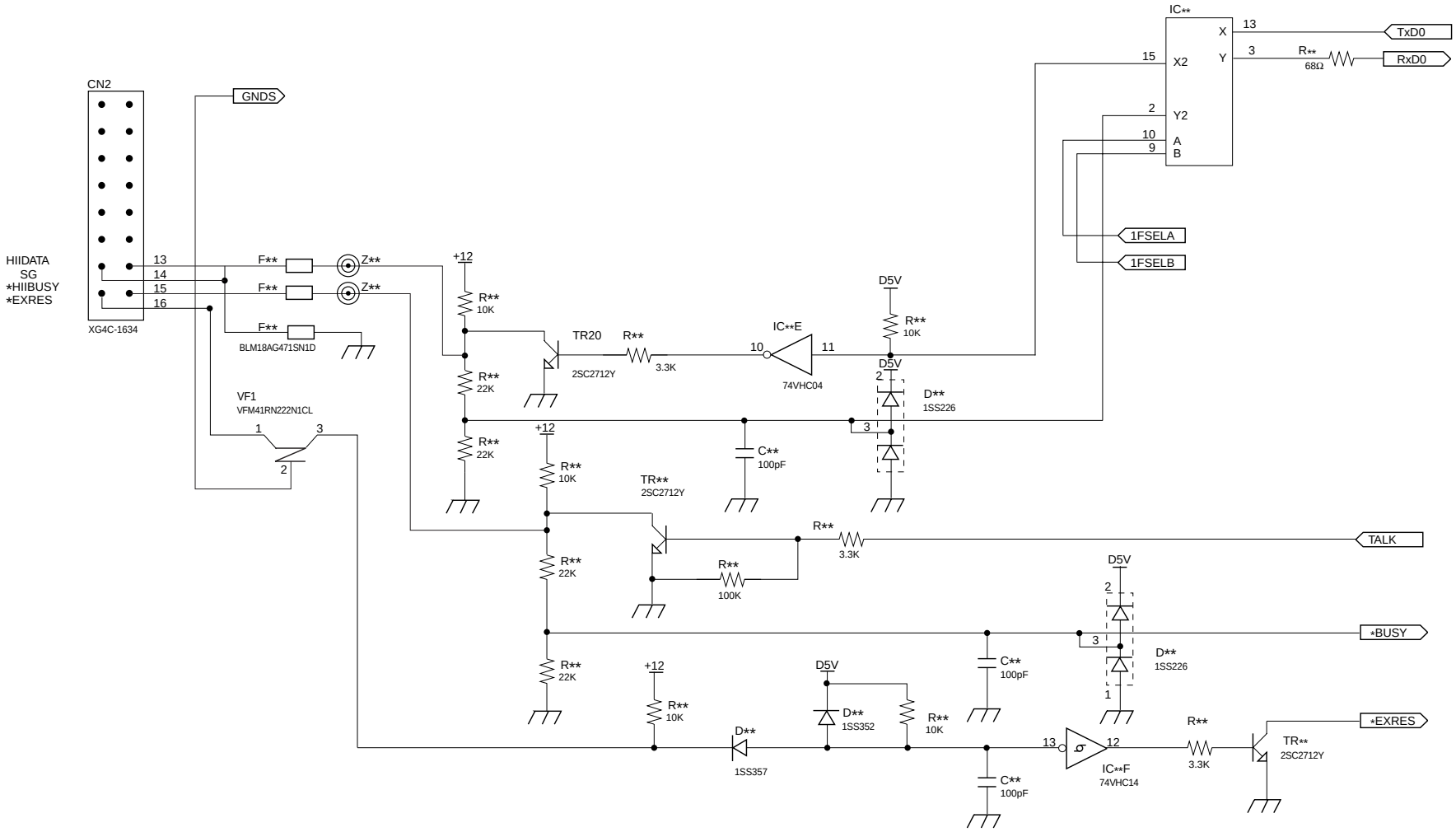
3-2-1 ID-003 Interface Circuit



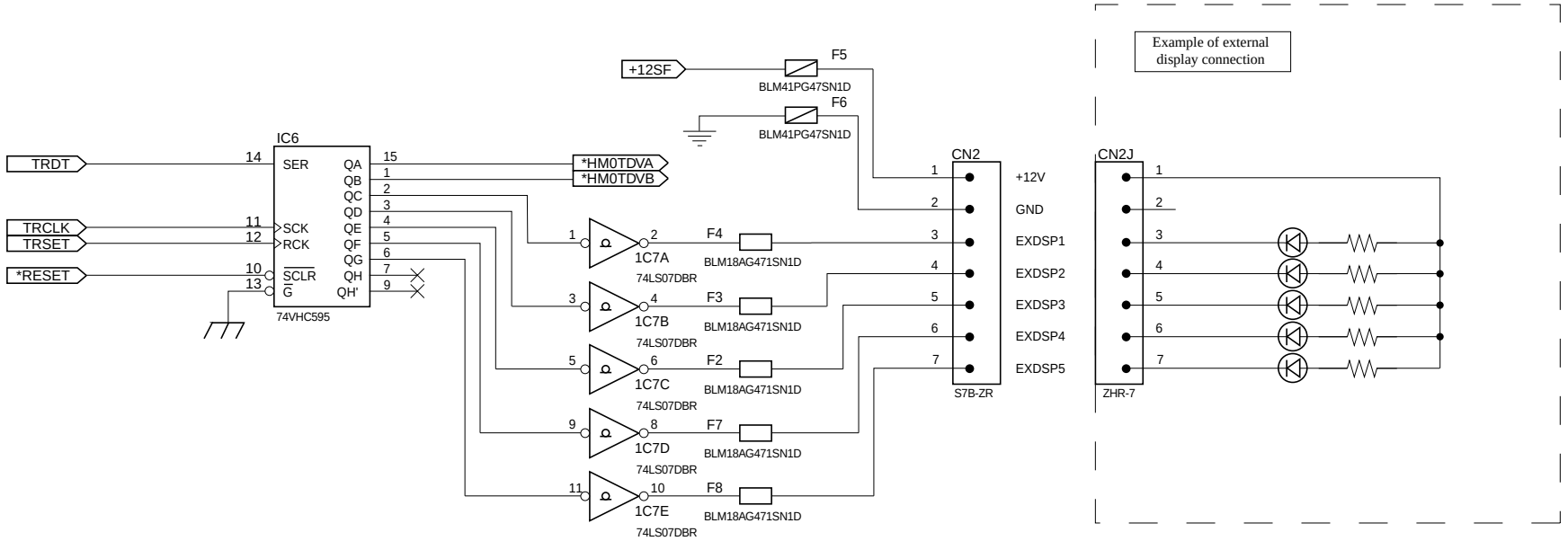
3-2-2 ID-0E3 (ccTalk) Interface Circuit



3-2-3 ID-0F3 (HII) Interface Circuit

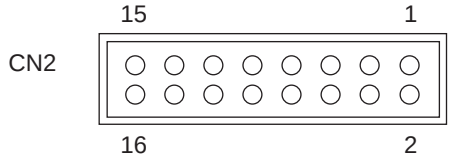


3-3 External Display Circuit (EBA-30/31/32/33/34/35)



4. Pin Assignment

4-1 Interface connector CN2 on the EBA-30/31 CPU board



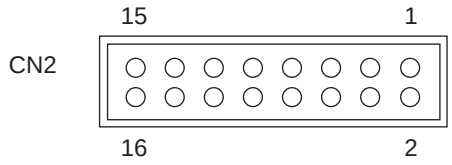
4-1-1 The pin assignment of ID-003 JCM bidirectional serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V	In	Power supply input 12V
2	GND		GND
3	+12V	In	Power supply input 12V
4	GND		GND
5	TXD	Out	Output signal line from acceptor to controller
6	SG		Signal ground
7	RXD	In	Input signal line from controller to acceptor
8	SG		Signal ground
9	(TXD)	Out	NC (Do not use this pin for ID-003.)
10	(RXD)	In	NC (Do not use this pin for ID-003.)
11	(MDB COM)		NC (Do not use this pin for ID-003.)
12	(DIR)	Out	NC (Do not use this pin for ID-003.)
13	(SICLK)	Out	NC (Do not use this pin for ID-003.)
14	(SG)		NC (Do not use this pin for ID-003.)
15	(SETLD)	Out	NC (Do not use this pin for ID-003.)
16	(SG)		NC (Do not use this pin for ID-003.)

4-1-2 The pin assignment of ID-0D3 MDB serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V	In	Power supply input 12V
2	GND		GND
3	+12V	In	Power supply input 12V
4	GND		GND
5	(TXD)	Out	NC (Do not use this pin for ID-0D3.)
6	(SG)		NC (Do not use this pin for ID-0D3.)
7	(RXD)	In	NC (Do not use this pin for ID-0D3.)
8	(SG)		NC (Do not use this pin for ID-0D3.)
9	TXD	Out	Output signal line from acceptor to controller
10	RXD	In	Input signal line from controller to acceptor
11	MDB COM		MDB common signal line
12	(DIR)	Out	NC (Do not use this pin for ID-0D3.)
13	(SICLK)	Out	NC (Do not use this pin for ID-0D3.)
14	(SG)		NC (Do not use this pin for ID-0D3.)
15	(SETLD)	Out	NC (Do not use this pin for ID-0D3.)
16	(SG)		NC (Do not use this pin for ID-0D3.)

4-2 Interface connector CN2 on the EBA-32/33 CPU board



4-2-1 The pin assignment of ID-003 JCM bidirectional serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V	In	Power supply input 12V
2	GND		GND
3	+12V	In	Power supply input 12V
4	GND		GND
5	TXD	Out	Output signal line from acceptor to controller
6	SG		Signal ground
7	RXD	In	Input signal line from controller to acceptor
8	SG		Signal ground
9	(+5V)	Out	NC (Do not use this pin for ID-003.)
10	(GND)		NC (Do not use this pin for ID-003.)
11	(ccTalk TXD/RXD)	In/Out	NC (Do not use this pin for ID-003.)
12	(SG)		NC (Do not use this pin for ID-003.)
13	(HII DATA)	In/Out	NC (Do not use this pin for ID-003.)
14	(SG)		NC (Do not use this pin for ID-003.)
15	(HII BUSY)	In/Out	NC (Do not use this pin for ID-003.)
16	(Reset)	In	NC (Do not use this pin for ID-003.)

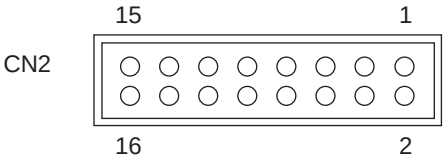
4-2-2 The pin assignment of ID-0E3 ccTalk serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V	In	Power supply input 12V
2	GND		GND
3	+12V	In	Power supply input 12V
4	GND		GND
5	(TXD)	Out	NC (Do not use this pin for ID-0E3.)
6	(SG)		NC (Do not use this pin for ID-0E3.)
7	(RXD)	In	NC (Do not use this pin for ID-0E3.)
8	(SG)		NC (Do not use this pin for ID-0E3.)
9	(+5V)	Out	NC (Do not use this pin for ID-0E3.)
10	(GND)		NC (Do not use this pin for ID-0E3.)
11	ccTalk TXD/RXD	In/Out	CcTalk/DATA: CcTalk data line
12	SG		CcTalk 0 V
13	(HII DATA)	In/Out	NC (Do not use this pin for ID-0E3.)
14	SG		CcTalk/SERIAL MODE : 0 V
15	(HII BUSY)	In/Out	NC (Do not use this pin for ID-0E3.)
16	Reset	In	CcTalk/RESET: Reset input signal line (option)

4-2-3 The pin assignment of ID-0F3 HII serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V	In	Power supply input 12V
2	GND		GND
3	+12V	In	Power supply input 12V
4	GND		GND
5	(TXD)	Out	NC (Do not use this pin for ID-0F3.)
6	(SG)		NC (Do not use this pin for ID-0F3.)
7	(RXD)	In	NC (Do not use this pin for ID-0F3.)
8	(SG)		NC (Do not use this pin for ID-0F3.)
9	(+5V)	Out	NC (Do not use this pin for ID-0F3.)
10	(GND)		NC (Do not use this pin for ID-0F3.)
11	ccTalk TXD/RXD	In/Out	NC (Do not use this pin for ID-0F3.)
12	SG		HII Data Return
13	(HII DATA)	In/Out	HII/Data: HII data line
14	SG		HII Busy return
15	(HII BUSY)	In/Out	HII/Busy: BUSY line
16	Reset	In	HII/Reset: Reset line

4-3 Interface connector CN2 on the EBA-34/35 CPU board



4-3-1 The pin assignment of ID-003 JCM bidirectional serial interface

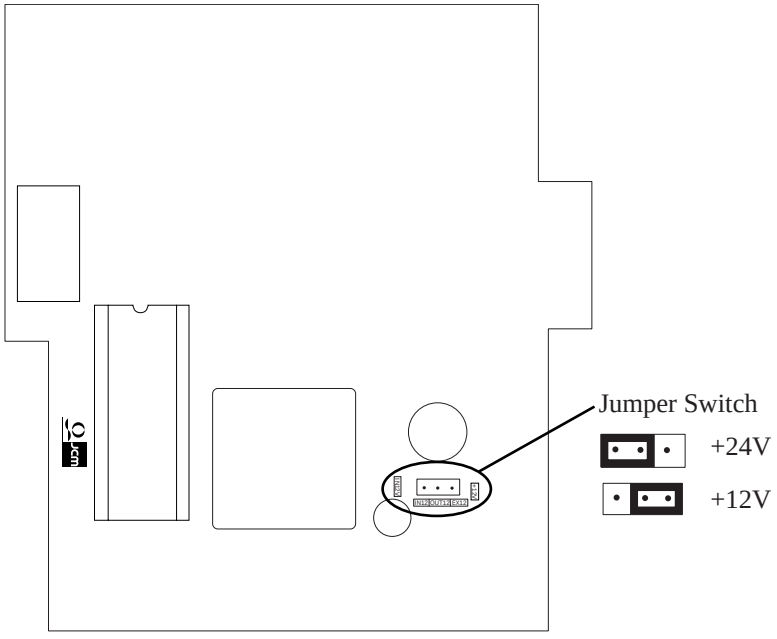
Pin No.	Signal name	I/O	Description of signal
1	+12V/+24V	In	Power supply input +12V or +24V
2	GND		GND
3	+12V/+24V	In	Power supply input +12V or +24V
4	GND		GND
5	TXD	Out	Output signal line from acceptor to controller
6	SG		Signal ground
7	RXD	In	Input signal line from controller to acceptor
8	SG		Signal ground
9	(MTXD)		NC (Do not use this pin for ID-003.)
10	(MRXD)		NC (Do not use this pin for ID-003.)
11	(MCOM)		NC (Do not use this pin for ID-003.)
12	(DIR)		NC (Do not use this pin for ID-003.)
13	(SICLK)		NC (Do not use this pin for ID-003.)
14	(SG)		NC (Do not use this pin for ID-003.)
15	(SETLD)		NC (Do not use this pin for ID-003.)
16	(SG)		NC (Do not use this pin for ID-003.)

4-3-2 The pin assignment of ID-0D3 MDB serial interface

Pin No.	Signal name	I/O	Description of signal
1	+12V/+24V	In	Power supply input +12V or +24V
2	GND		GND
3	+12V/+24V	In	Power supply input +12V or +24V
4	GND		GND
5	(TXD)		NC (Do not use this pin for ID-0D3.)
6	(SG)		NC (Do not use this pin for ID-0D3.)
7	(RXD)		NC (Do not use this pin for ID-0D3.)
8	(SG)		NC (Do not use this pin for ID-0D3.)
9	MTXD	Out	Output signal line from acceptor to controller
10	MRXD	In	Input signal line from controller to acceptor
11	MCOM		MDB common signal line
12	(DIR)		NC (Do not use this pin for ID-0D3.)
13	(SICLK)		NC (Do not use this pin for ID-0D3.)
14	(SG)		NC (Do not use this pin for ID-0D3.)
15	(SETLD)		NC (Do not use this pin for ID-0D3.)
16	(SG)		NC (Do not use this pin for ID-0D3.)

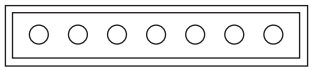
4-3-3 Switching the power supply input +12V/+24V

When you want to switch the power supply input, you must change the jumper switch. The jumper switch is located on the CPU board and the settings are as shown below.



4-4 External display connector on the sensor board

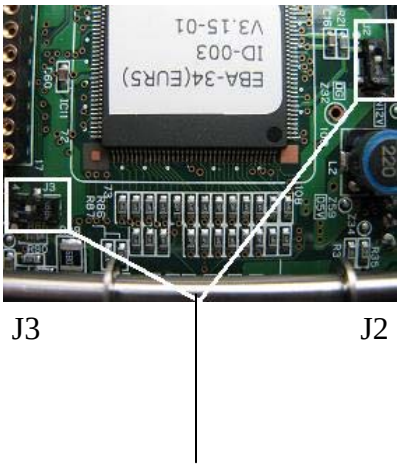
CN2



1 7

Pin No.	Signal name	Description of signal
1	+12V	+12 V output (100 mA max.)
2	GND	GND
3	EXDSP1	(1) Turn ON when the unit is able to accept banknotes. (2) Turn OFF when the unit is unable to accept banknotes.
4	EXDSP2	
5	EXDSP3	
6	EXDSP4	
7	EXDSP5	

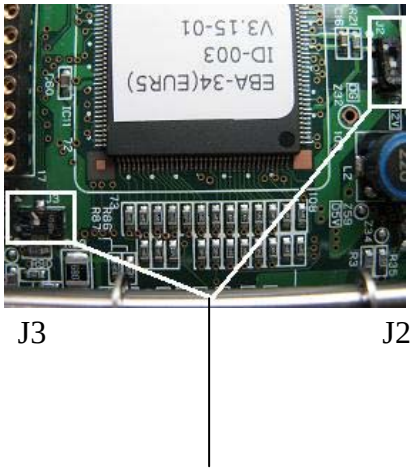
How to change Memory from Flash to EPROM of EBA-3x-xx by switches



J3 J2

to use Flash memory, please set the switches J3 and J2 in position above. Switches to the left and up position (shown to the white dot)

FLASH MEMORY



J3 J2

to use Eprom memory, please set the switches J3 and J2 in position above. Switches to the right and down position (opposite side of white dot)

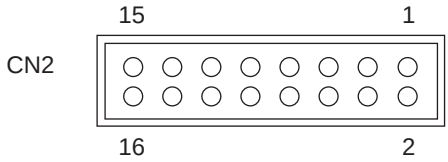
EPROM MEMORY

5. Connector

5-1 The interface connector and the mating connectors

(1) Acceptor's connector

Box type plug XG4C-1634 (OMRON)



(2) Mating connector 1

- XG5M-1635-N(OMRON)
- Contact (incorporated in the housing)
- Recommended wire: Non-bundled AWG26 to 28 UL1007

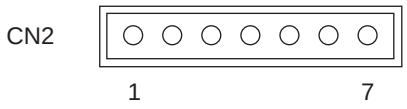
Mating connector 2

- MIL type socket XG4M-1630-T (OMRON)
- Recommended wire: 27 mm-pitch twisted flat cable AWG28 UL2651

5-2 The external display connector and the mating connector

(1) Acceptor's connector

Pin header S7B-ZR (JST)



(2) Mating connector

- Housing ZHR-7 (JST)
- Contact SZH-002T-P0.5
- Recommended wire AWG26 to 28 UL1061

6. Description of DIP switches

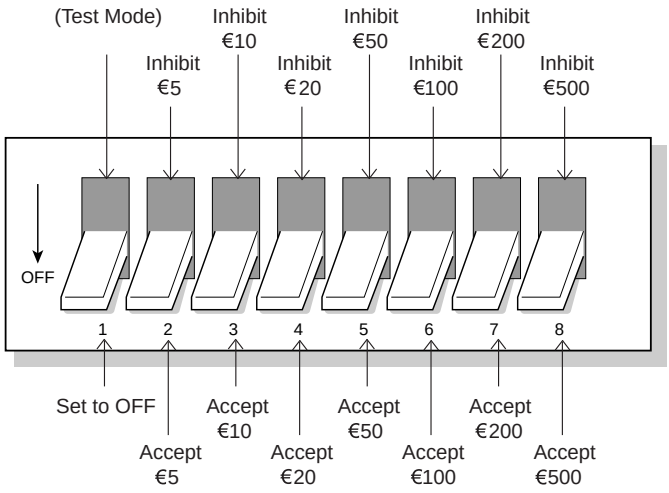
The DIP switches are to specify the types of acceptable denominations and operation mode of the bill acceptor. DIP Switch 1 is located on the right side of CPU board, and Dip Switch 2 is located under ROM cover. (See Chapter 1. 4 Component Names)

6-1 Settings of Dip Switch 1

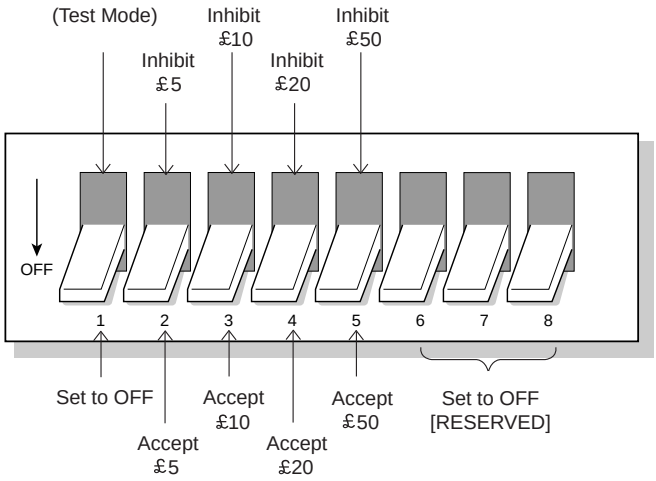
The DIP Switch 1 specifies the denominations to be accepted by the bill acceptor

Refer to the software specifications for the DIP switch settings.

<Example1> EBA-30/31/34/35-SD3 (EUR5) and EBA-30/31/34/35 (EUR5)



<Example2> EBA-32/33-SD3 (GBR) and EBA-32/33 (GBR)



(Remarks) In both examples, Switch #1 of the DIP Switch 1 is the selector of normal operation and test mode.

For normal operation, make sure to set Switch #1 to OFF before turning on the power.

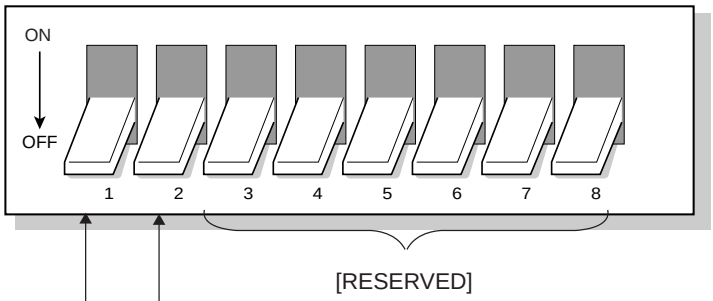
If Switch #1 is ON at the time of power-on, the unit operates in test mode.

6-2 Settings of DIP Switch 2

This DIP switch is used to select the acceptor's operations with or without SD3 stacker.

This switch is also used to specify whether to enable or disable the optional key switch of the SD3 stacker.

<Example1> EBA-30/31/34/35



Switch #2	Key Switch ON/OFF
ON	Enabled
OFF	Disabled (for operation w/o SD3 stacker, set this switch to OFF).

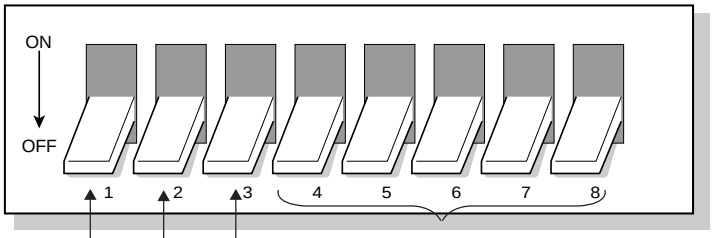
Switch #1	Operation with/without SD3 stacker
ON	With SD3 stacker
OFF	Without SD3 stacker

(Remarks) 1) Make sure to set DIP Switch 2 prior to power-up.
Any changes in settings after power-up is invalid.

2) For operation without stacker, set Switch #1 OFF. The unit does not operate properly in inappropriate settings.

3) Key switch is the optional part to be installed on SD3 stacker during factory assembly.
For the units without key switch, set Switch #2 OFF.
The unit does not operate properly in inappropriate settings.

(Example2) EBA-32/33



Switch #3	ID-0E3 Encryption mode ON/OFF
ON	Non-encryption mode
OFF	Encryption mode

Switch #2	Key Switch ON/OFF
ON	Enabled
OFF	Disabled (for operation w/o SD3 stacker, set this switch to OFF).

Switch #1	Operation with/without SD3 stacker
ON	With SD3 stacker
OFF	Without SD3 stacker

(Remarks) 1) Make sure to set DIP switch 2 before power-up.
Any changes in settings after power-up is invalid.

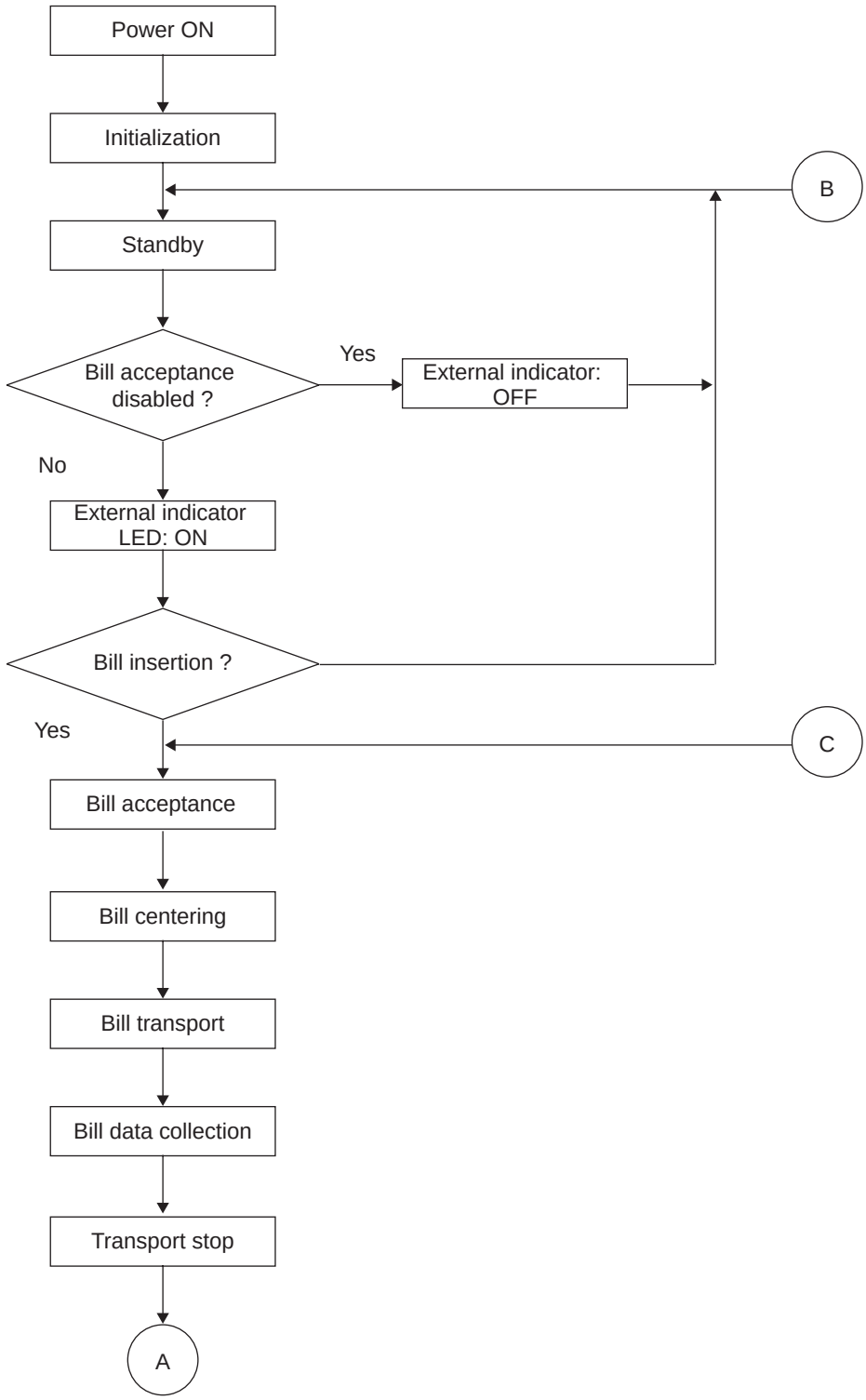
2) For operation without stacker, set Switch #1 OFF. The unit does not operate properly in inappropriate settings.

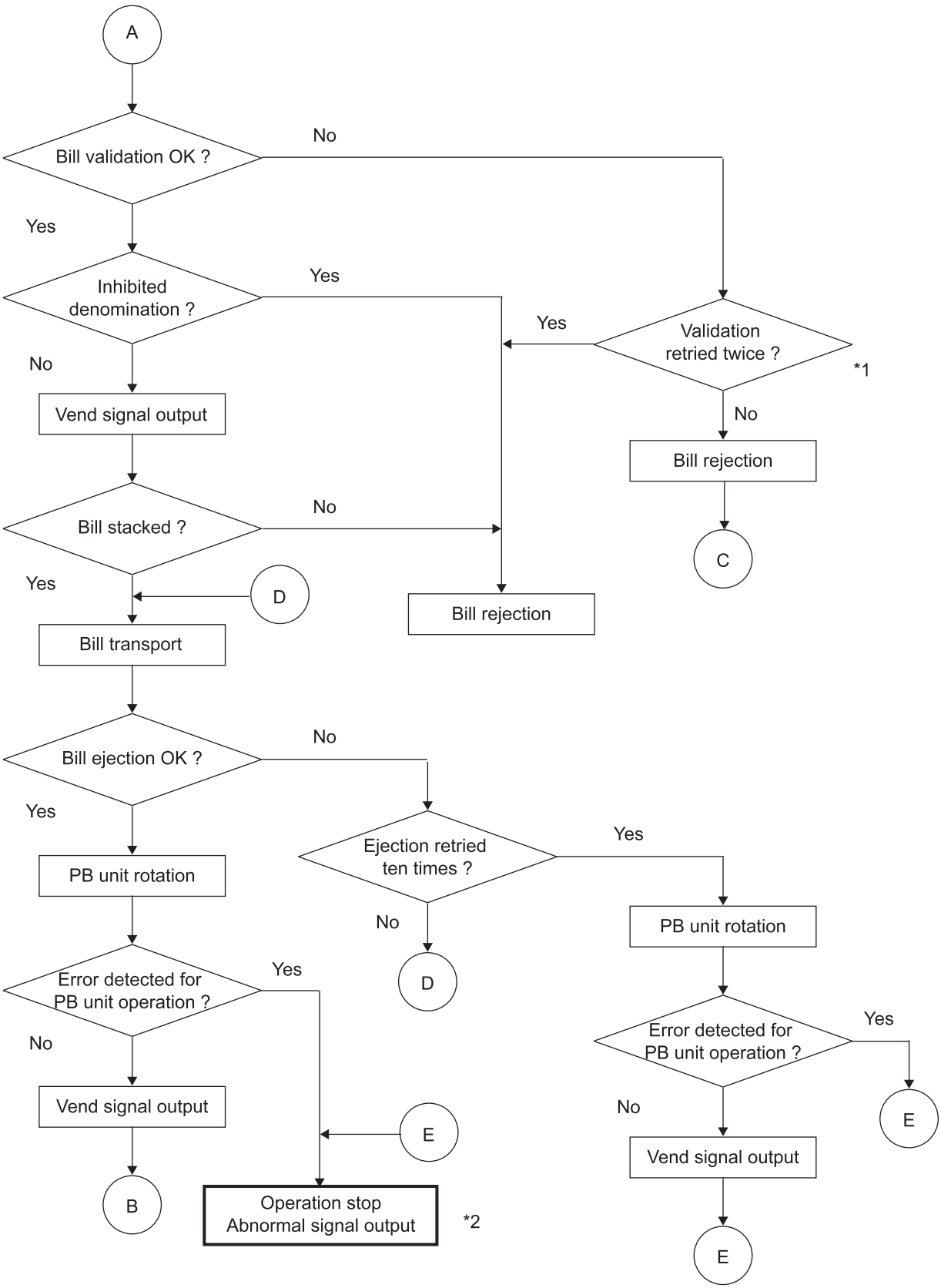
3) Key switch is the optional part to be installed on SD3 stacker during factory assembly.
For the units without key switch, set Switch #2 OFF.
The unit does not operate properly in inappropriate settings.

4) Switch #3 is the selector of ID-0E3 Encryption / Non-encryption mode.
For communication in non-encryption mode, set Switch #3 to OFF. The unit does not operate properly in inappropriate settings.

7. Operational Flow (example of JCM ID-003 protocol)

7-1 Operation without SD3 stacker

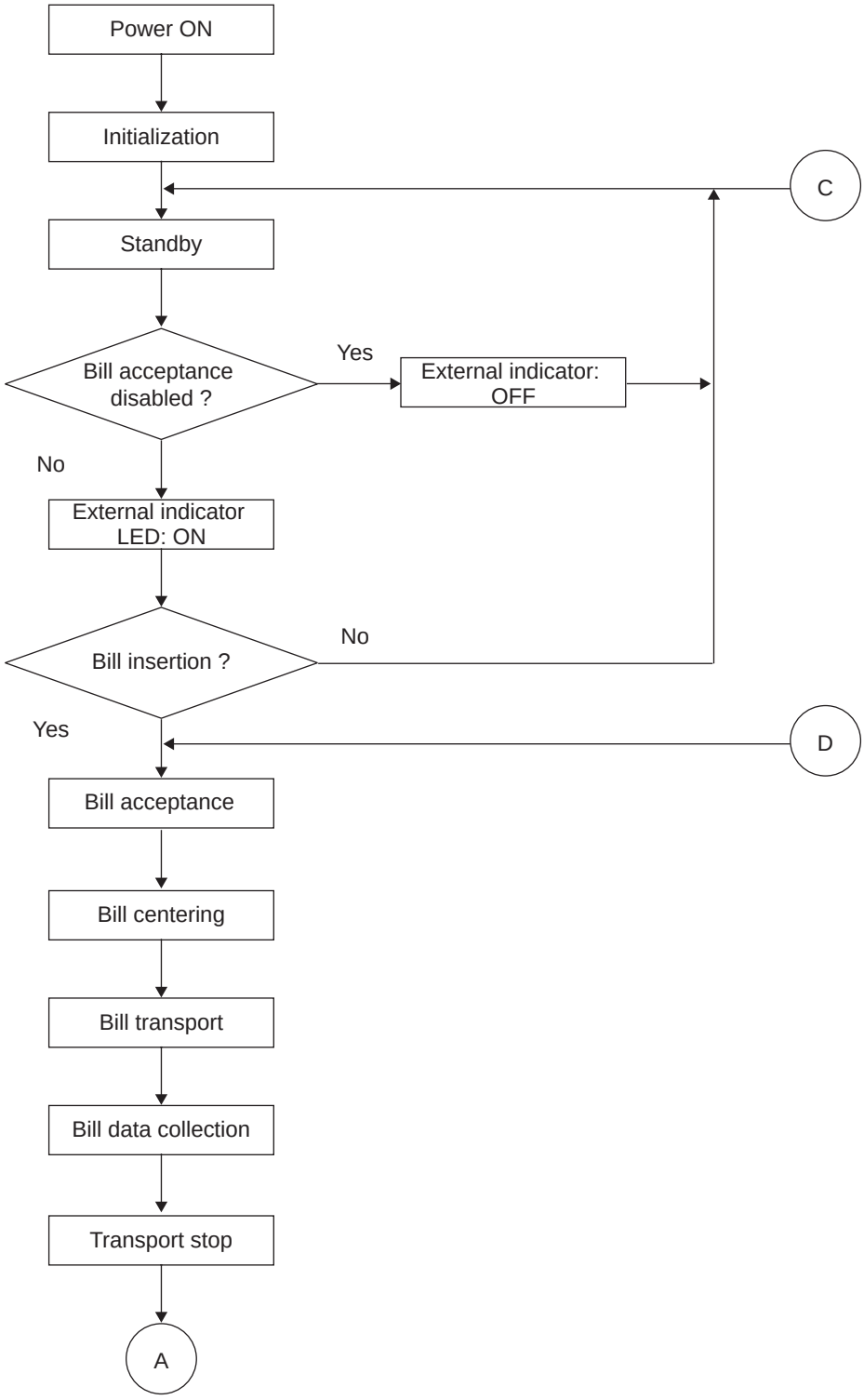


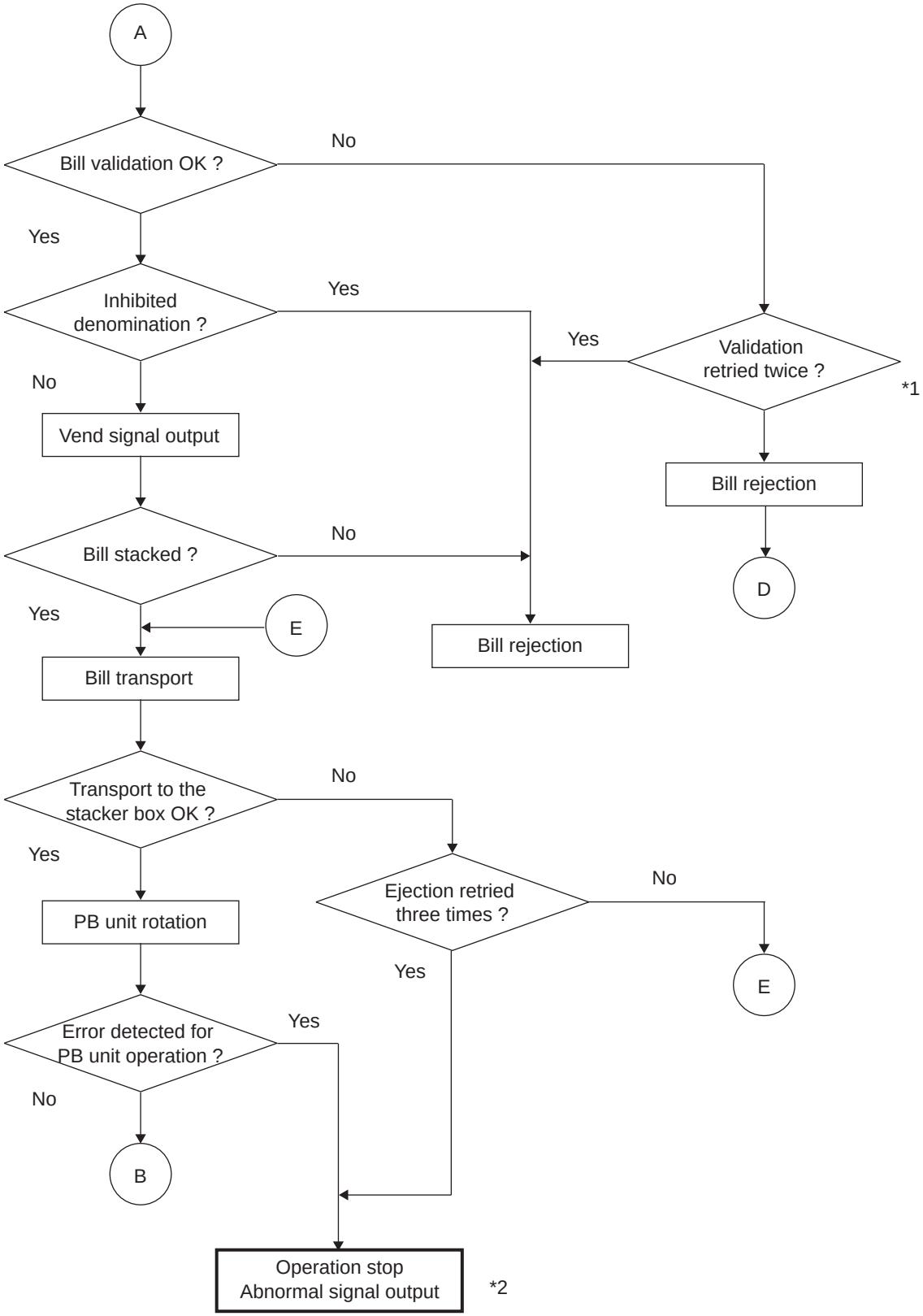

A
Bill validation OK ?
No
Yes
Inhibited denomination ?
Yes
No
Vend signal output
Bill stacked ?
No
Yes
D
Bill transport
Bill rejection
Yes
Validation retried twice ?
*1
No
Bill rejection
C
Bill ejection OK ?
No
Yes
PB unit rotation
Error detected for PB unit operation ?
Yes
No
Vend signal output
B
E
Operation stop Abnormal signal output
*2
Ejection retried ten times ?
Yes
No
D
PB unit rotation
Error detected for PB unit operation ?
Yes
No
Vend signal output
E
E

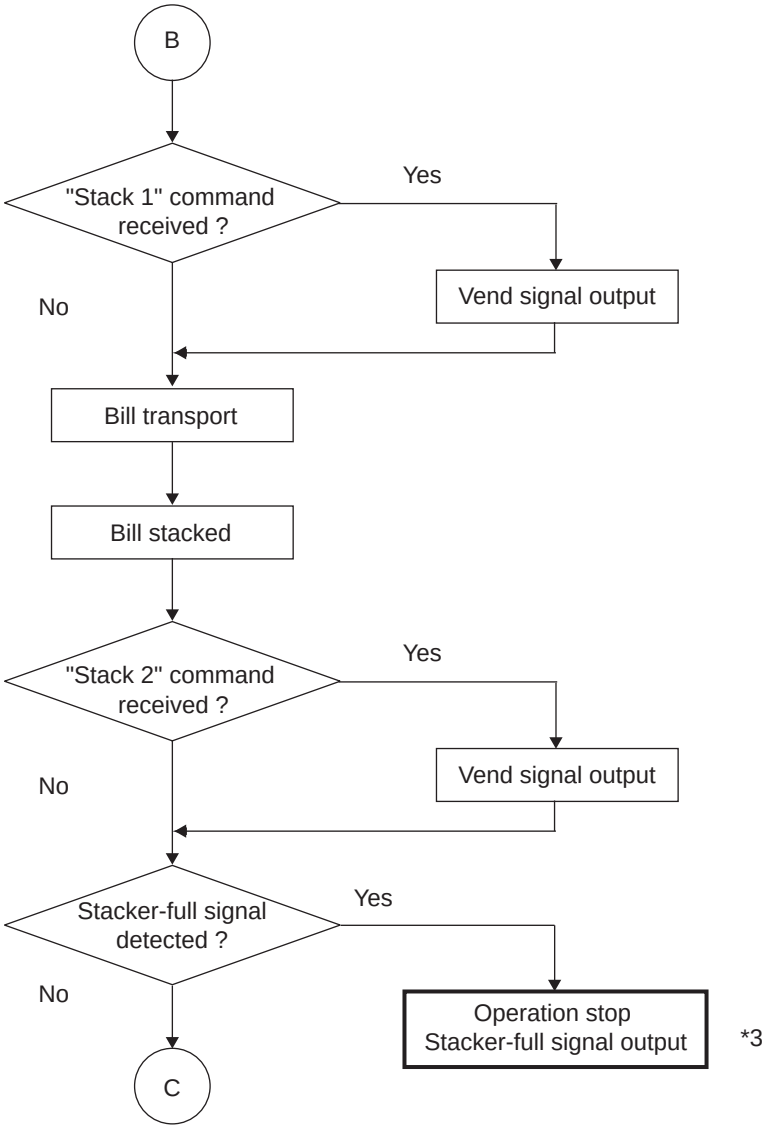
*1: When the bill validation result is "NG", the unit rejects the bill and accept it again, to try the second validation.

*2: If the abnormal signal is output, remove the cause of error, and then turn on the power again, or send a reset command from host controller.

7-2 Operation with SD3 stacker




A
Bill validation OK ?
No
Yes
Inhibited denomination ?
Yes
No
Validation retried twice ?
Yes
*1
Vend signal output
Bill rejection
Bill stacked ?
No
D
Yes
E
Bill rejection
Bill transport
Transport to the stacker box OK ?
No
Yes
Ejection retried three times ?
No
PB unit rotation
Yes
E
Error detected for PB unit operation ?
Yes
No
B
Operation stop
Abnormal signal output
*2



*1: When the bill validation result is "NG", the unit rejects the bill and accept it again, to try the second validation.

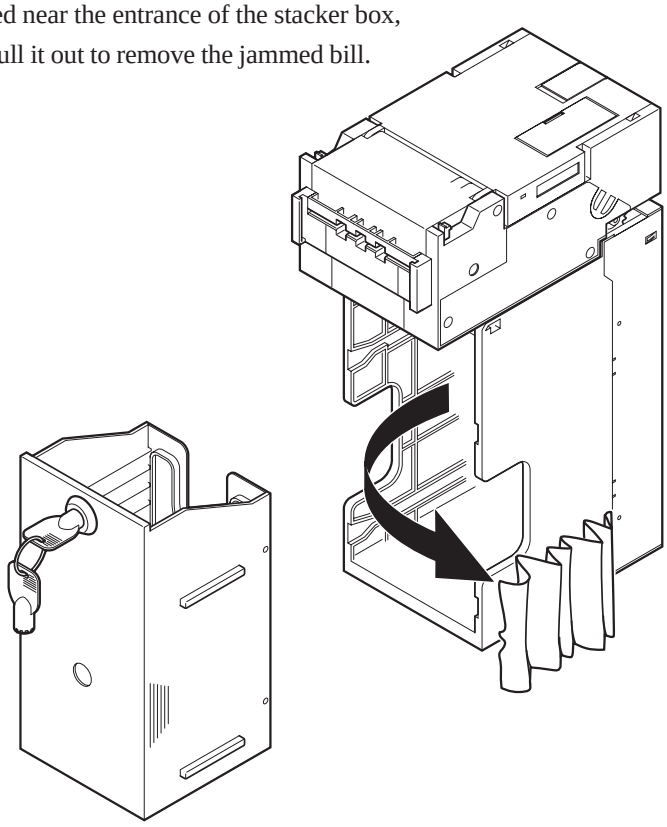
*2: If the abnormal signal is output, remove the cause of error, and then turn on the power again, or send a reset command from host controller.

*3: If the stacker-full signal is output, remove bills from the stacker box, and reposition the box. The machine automatically starts initialization.

8. Clearing Bill Jam

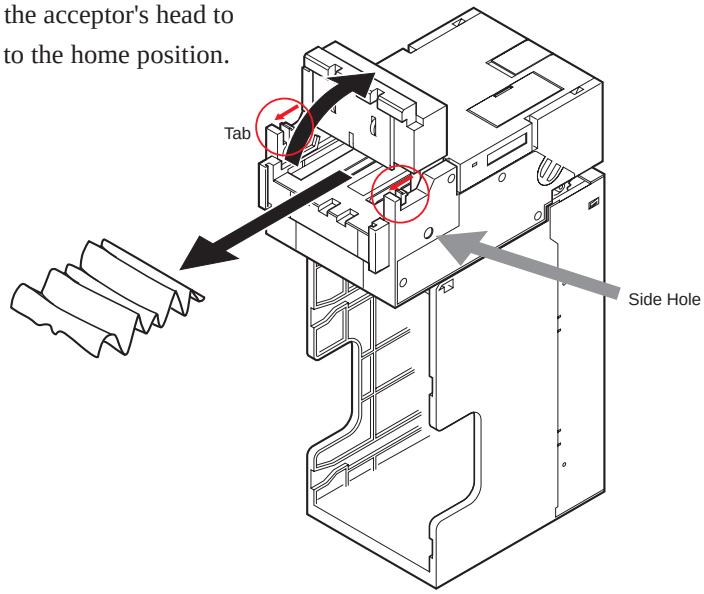
When a bill is jammed in Acceptor:

8-1 When a bill is jammed near the entrance of the stacker box, unlock the box and pull it out to remove the jammed bill.

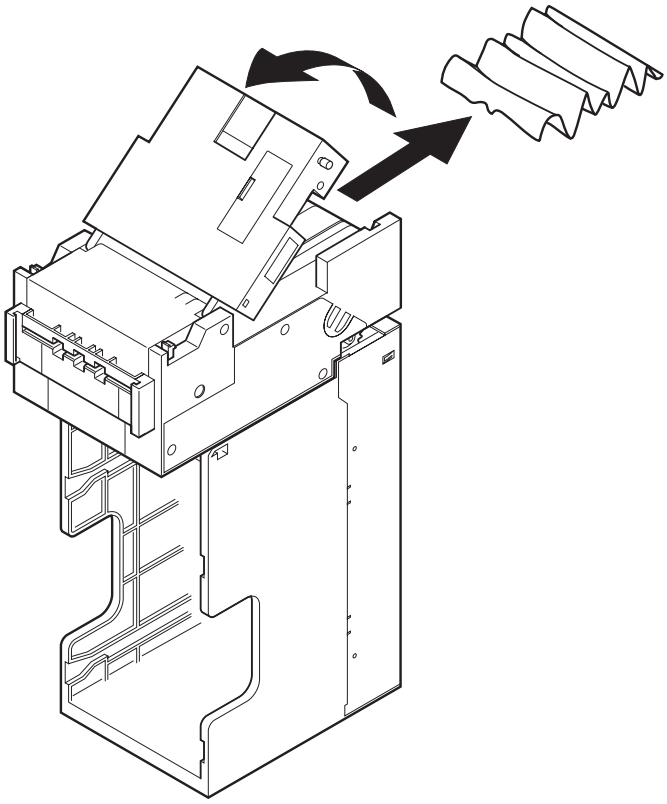


8-2 When a bill is jammed near the acceptor's entrance, pull the tabs on both sides of the acceptor forward to open the acceptor's head. Remove the jammed bill.

If the acceptor's head cannot be opened, use hexagon-head screwdriver on the side hole of the acceptor's head to reposition the centering guides to the home position.



8-3 When a bill is jammed in the rear part of the acceptor's head unit, open the acceptor's rear cover to remove the jammed bill.



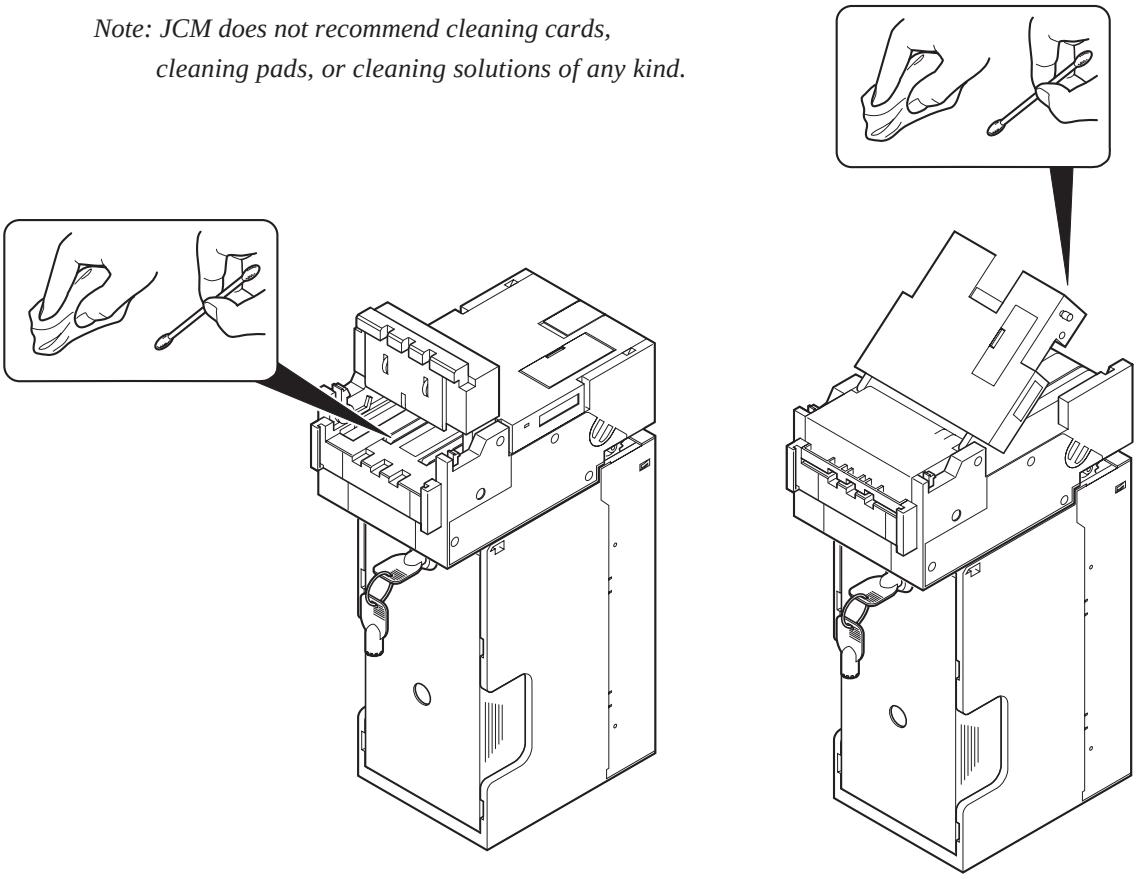
9. Cleaning / Preventive Maintenance

It is important to keep the bill bath, rollers, and belts clean. The sensor lenses are transparent, and made of polymer material. Handle them with care.
To clean the lenses, use a lint-free cloth and mild nonabrasive detergent such as liquid dish soap mixed with water.
<!> Do not use alcohol or thinner for cleaning.

(1) Pull the tabs on both sides of the acceptor forwarded to open the acceptor's head.

(2) Open the acceptor head front and rear covers to clean bill path, rollers and belts.

Note: JCM does not recommend cleaning cards, cleaning pads, or cleaning solutions of any kind.



Preventive Maintenance (P/M)

Do periodic P/M on acceptor's head and stacker unit to ensure proper operation. Use compressed air to blow out the paper fibers and other debris that builds up over time. Check the belts and all moving parts for wear and proper positioning. If the unit does not operate properly, it can cause bill jams.
After completing P/M, Auto-Calibration is recommended (See Chapter 7).

Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 4

Contents

Disassembly Instruction

1. Dissassembling Compete Unit
2. Disassembling Stacker Unit
3. Disassembling Acceptor Head Unit
4. Disassembling F-Guide Unit
5. Disassembling U-Guide Unit
6. Disassembling D-Guide Unit

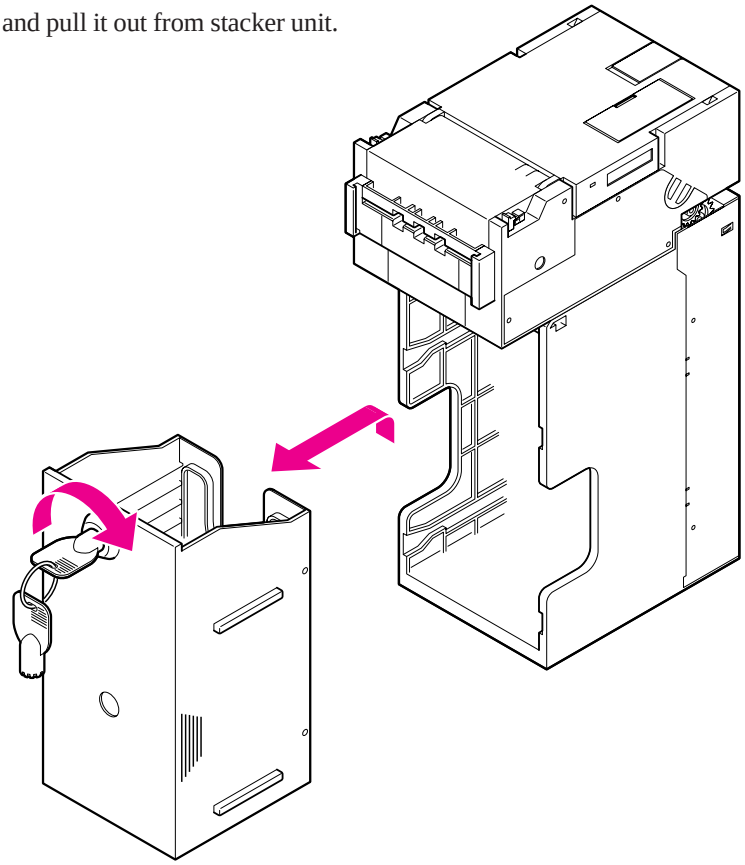
Issue 01/2006

JAPAN CASHMACHINE CO., LTD.

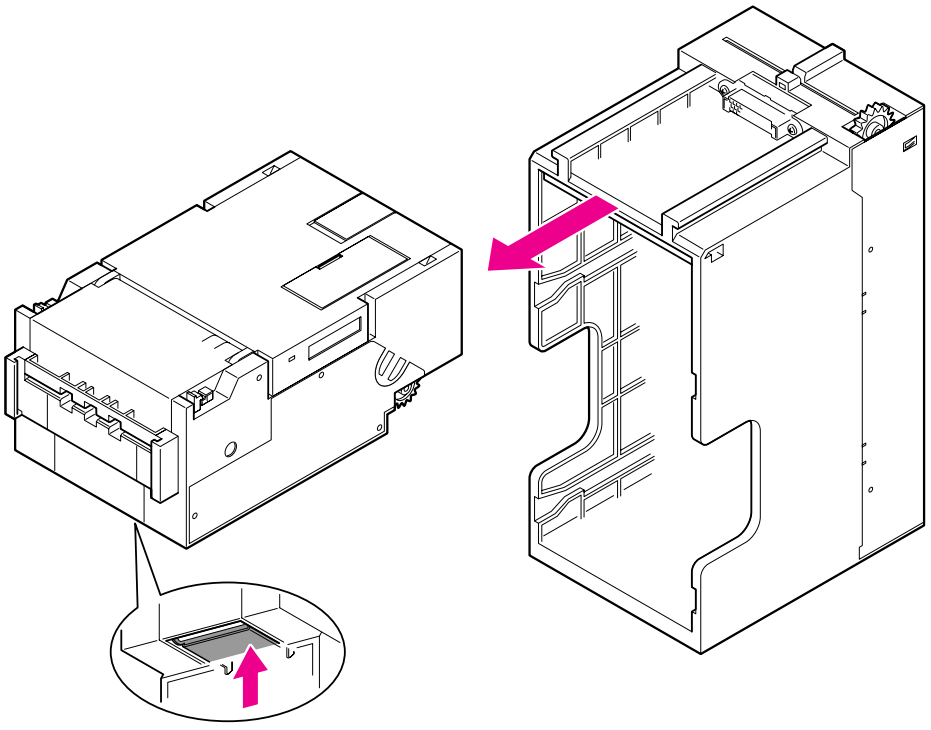
Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

1. Disassembling Complete Unit

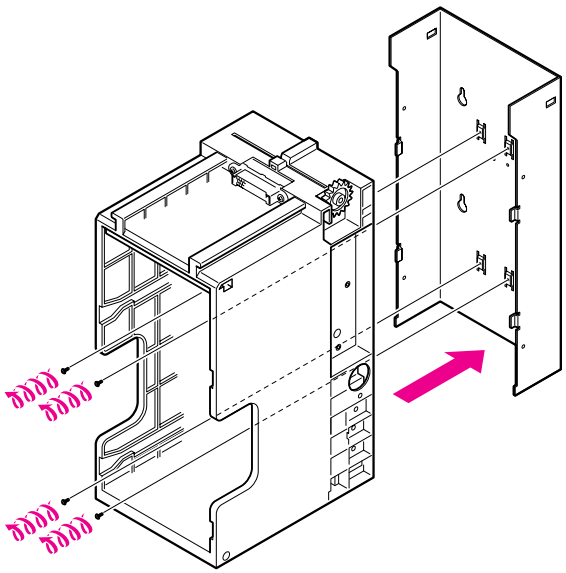
1-1 Unlock stacker box and pull it out from stacker unit.



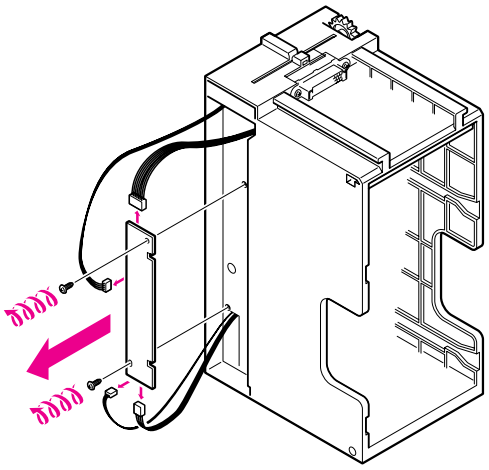
1-2 Remove acceptor head unit from the stacker unit.



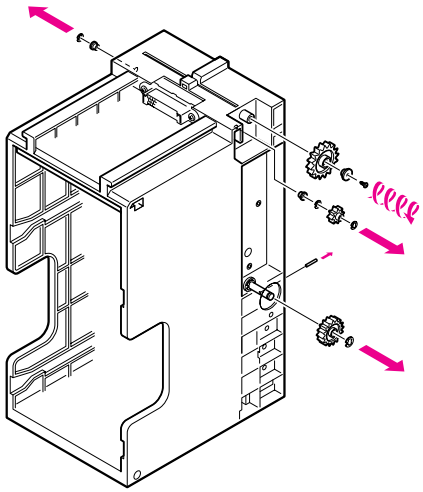
1-3 Remove the rear cover from the stacker unit.



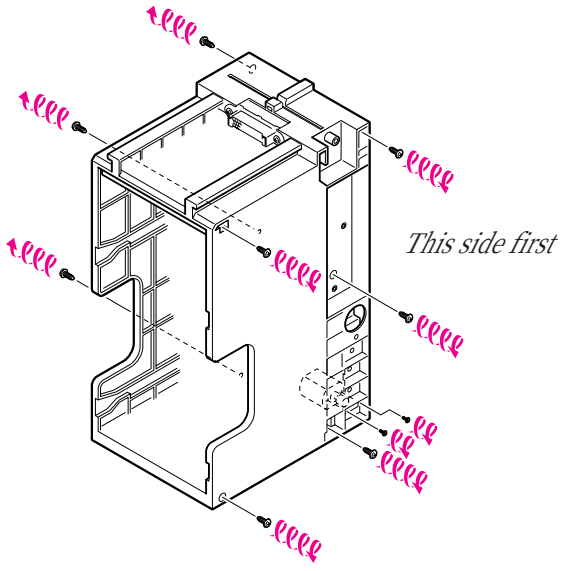
1-4 Remove stacker board at the left side of stacker unit.



1-5 Remove gears from the stacker unit.

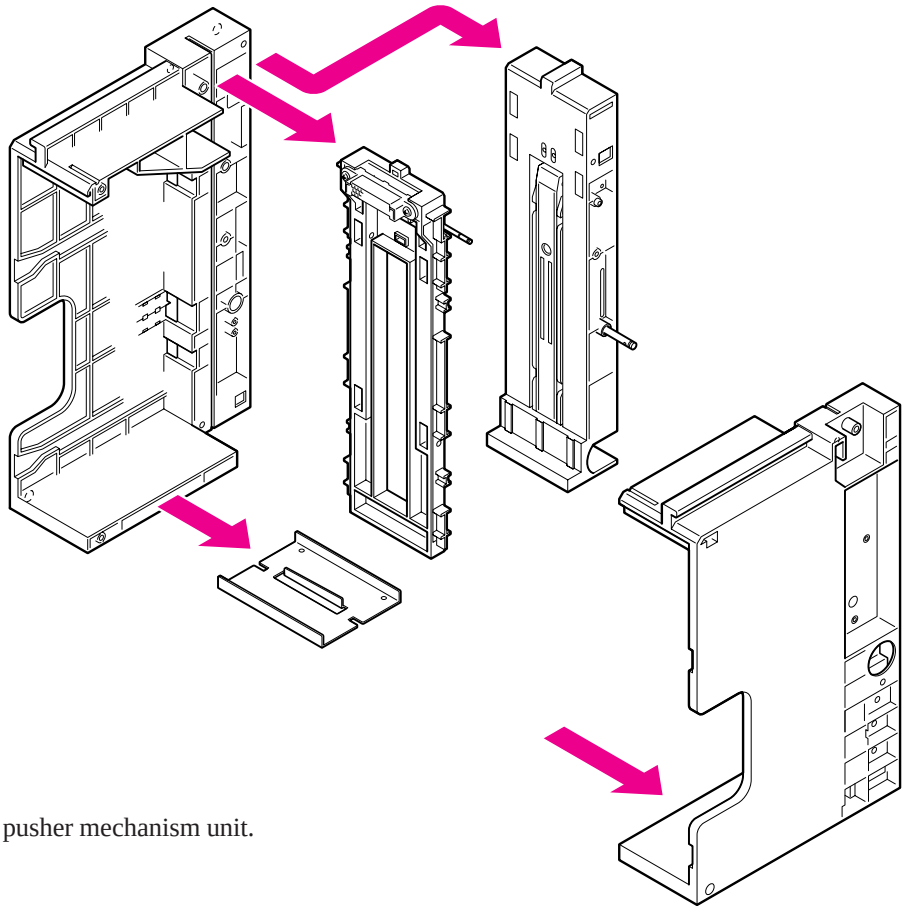


1-6 Remove screws of the right side from the stacker unit, and then remove screws of the left side.

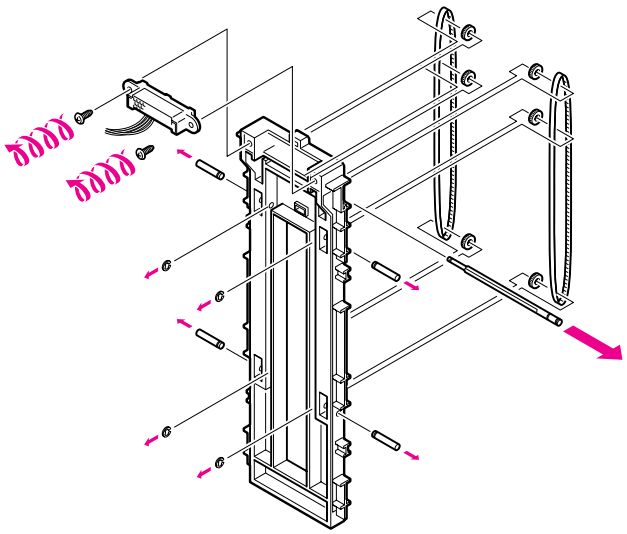


2. Disassembling Stacker Unit

2-1 Separate the stacker unit into 5 parts.

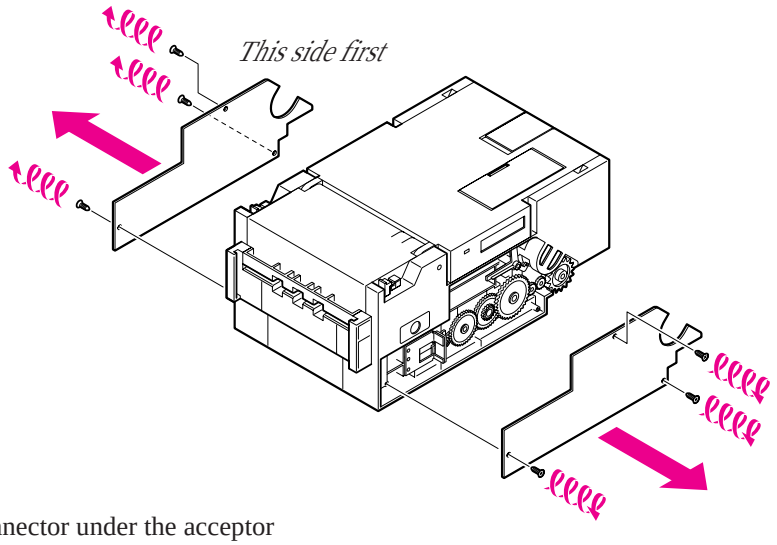


2-2 Disassemble pusher mechanism unit.

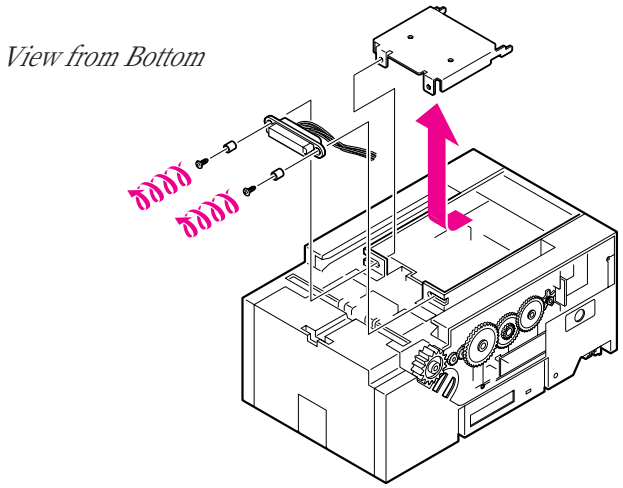


3. Disassembling Acceptor Head Unit

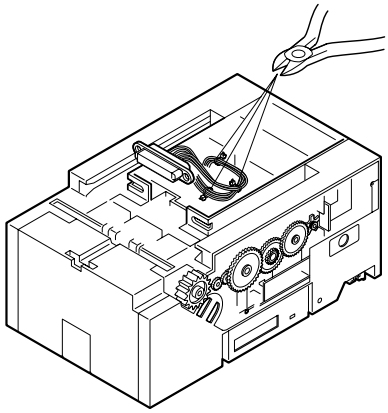
3-1 Remove the left-side cover from the acceptor head unit, and then remove the right-side cover.



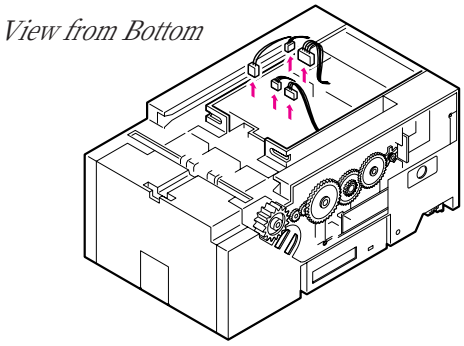
3-2 Remove the connector under the acceptor head unit.



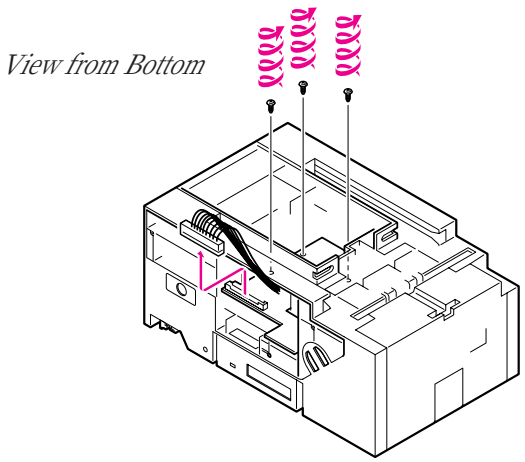
3-3 Cut the bands which bind up three bundles of harness.



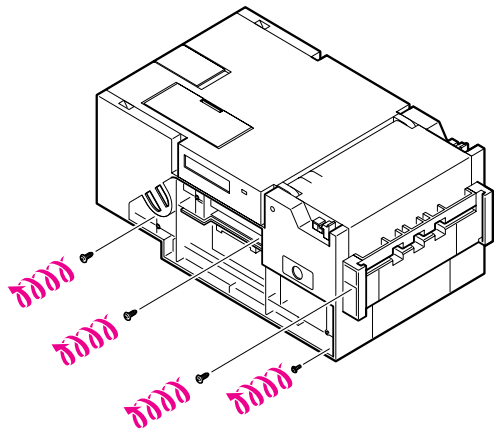
3-4 Remove connectors from CPU board of Acceptor's head unit.



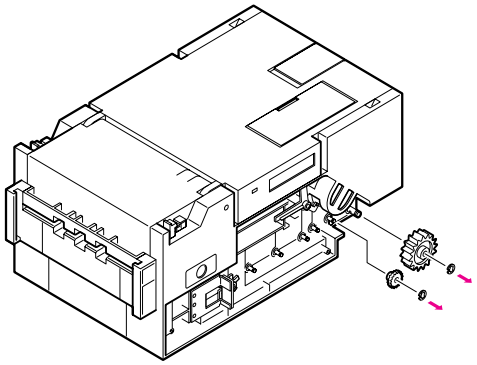
3-5 Remove fixing screws from CPU board of Acceptor's head unit.



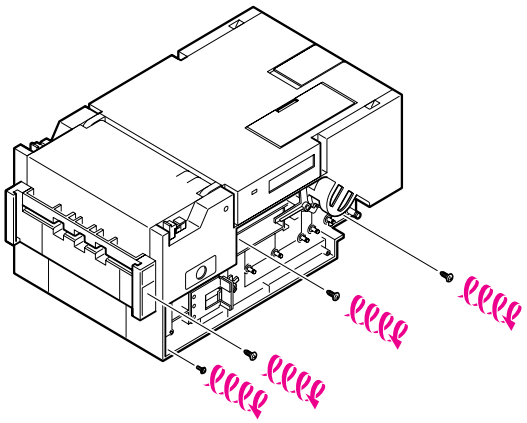
3-6 Remove screws of L-guide unit.



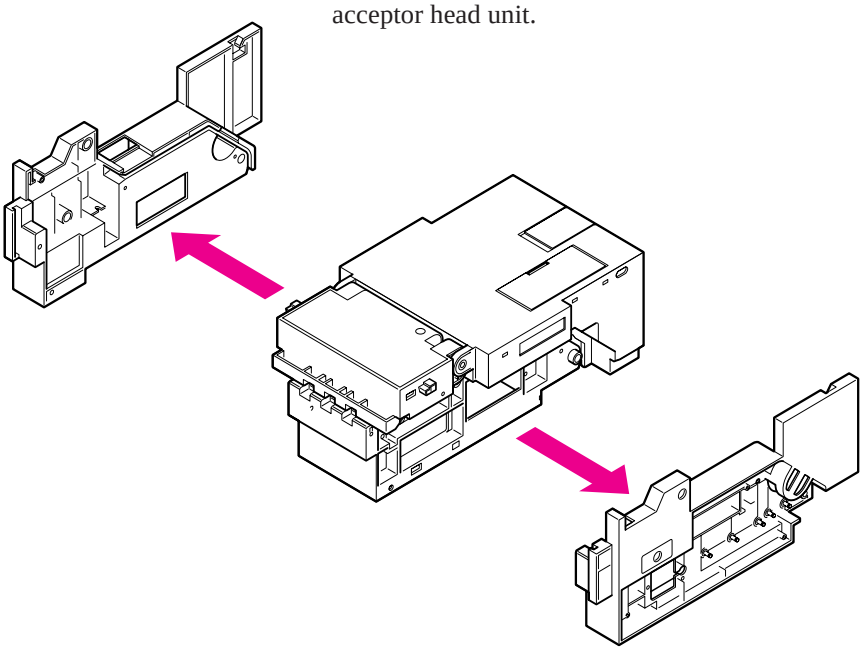
3-7 Remove gears at right side of acceptor head unit.



3-8 Remove screws of R-guide unit.

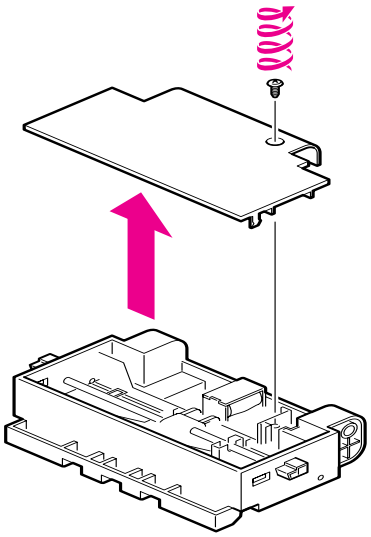


3-9 Remove L-guide unit and R-guide unit from acceptor head unit.

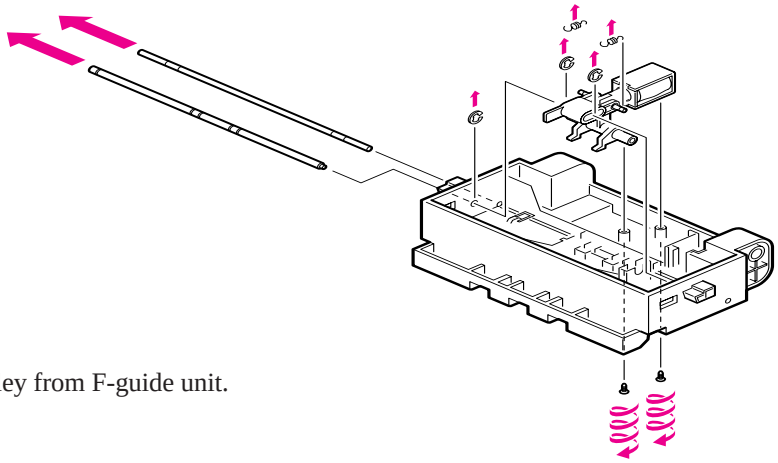


4. Disassembling F-Guide Unit

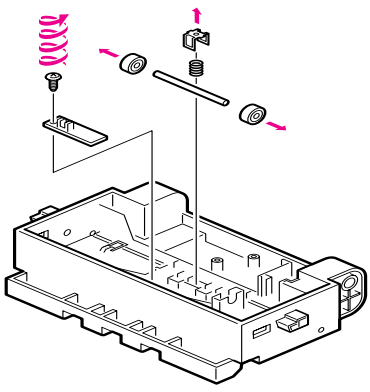
4-1 Remove the cover from F-guide unit.



4-2 Remove the solenoid from F-guide unit.

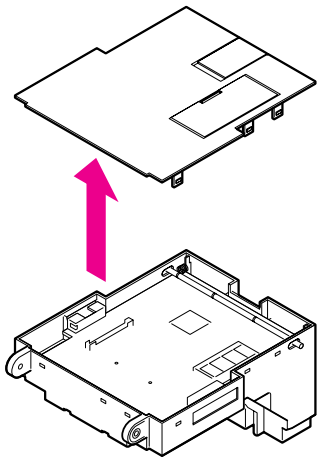


4-3 Remove the board and the pulley from F-guide unit.

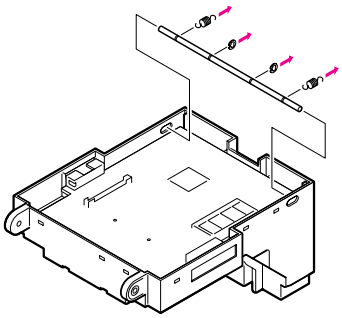


5. Disassembling U-Guide Unit

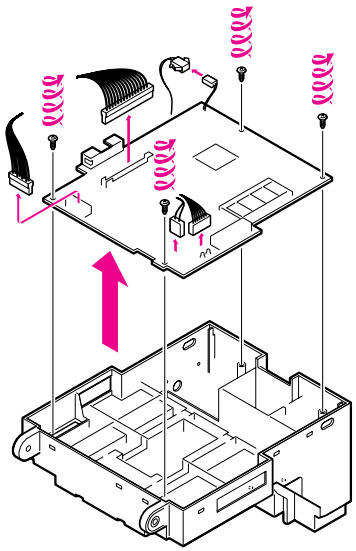
5-1 Remove the cover from U-guide unit.



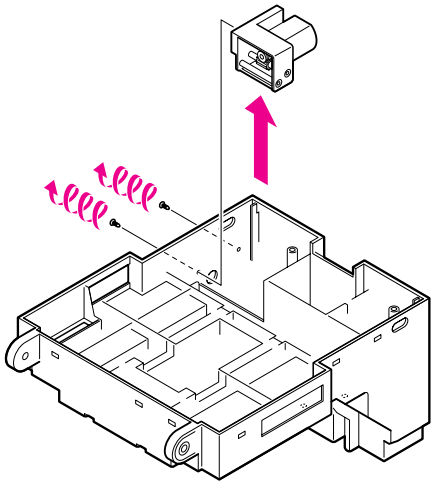
5-2 Remove the shaft from U-guide unit.



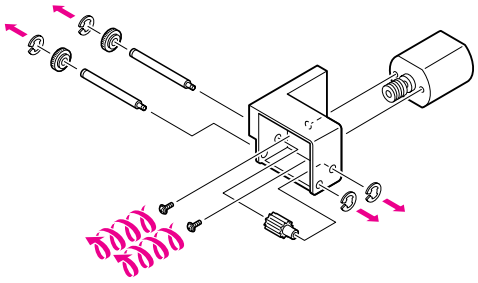
5-3 Remove CPU board from U-guide unit.



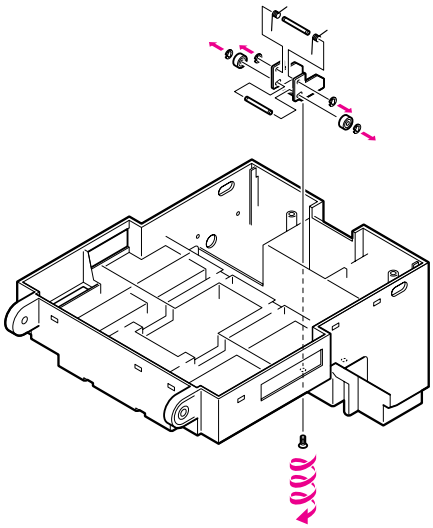
5-4 Remove the gear-box from U-guide unit.



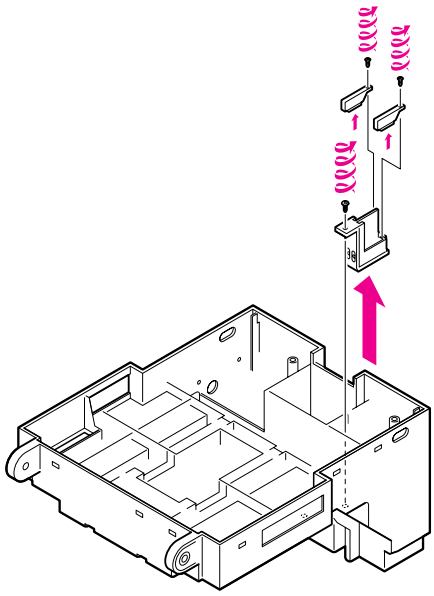
5-5 Remove the motor and the roller from the gear-box.



5-6 Remove the bracket from U-guide unit.

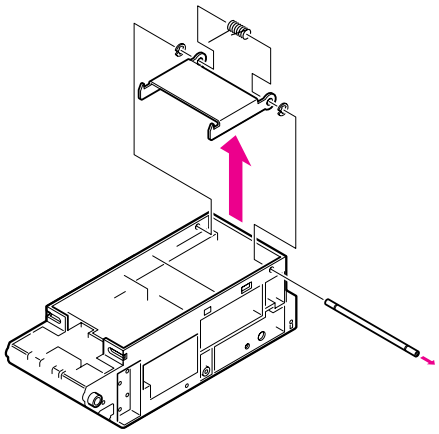


5-7 Remove the prism guide from U-guide unit.

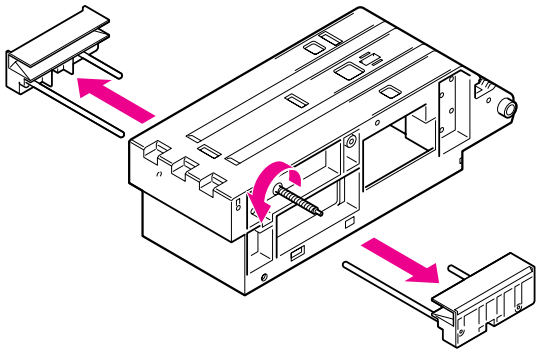


6. Disassembling D-Guide Unit

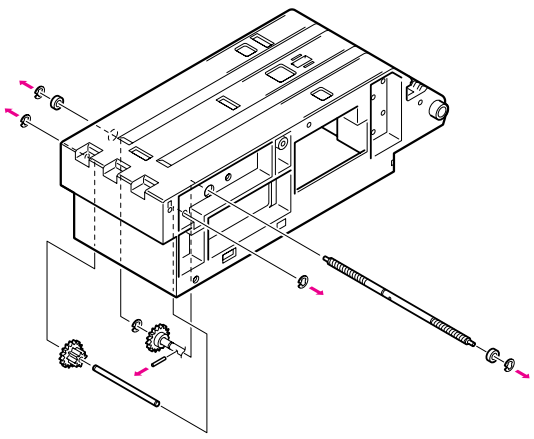
6-1 Remove the ratchet from D-guide unit.



6-2 Remove the centering guides from D-guide unit.



6-3 Remove screws and gears from D-guide unit.



Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 5

Contents

Wiring Diagrams

1. EBA-30/31 Wiring Diagram
2. EBA-32/33 Wiring Diagram
3. EBA-34/35 Wiring Diagram

Issue 01/2006

JAPAN CASHMACHINE CO., LTD.

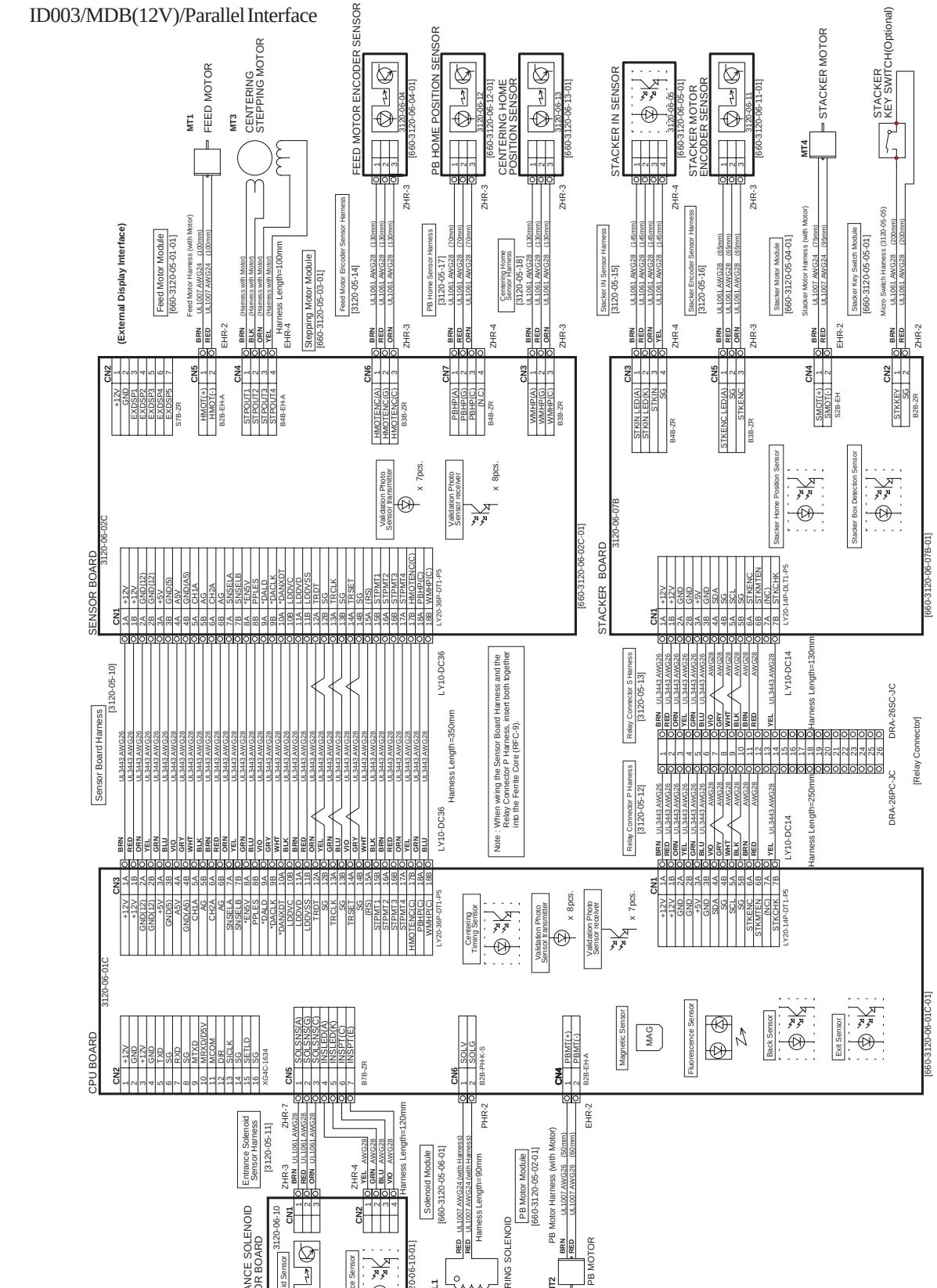
Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

1. EBA-30/31 Wiring Diagram

EBA-30/31 CPU Board

(Power Supply and External Communication Interface)

ID003/MDB(12V)/Parallel Interface

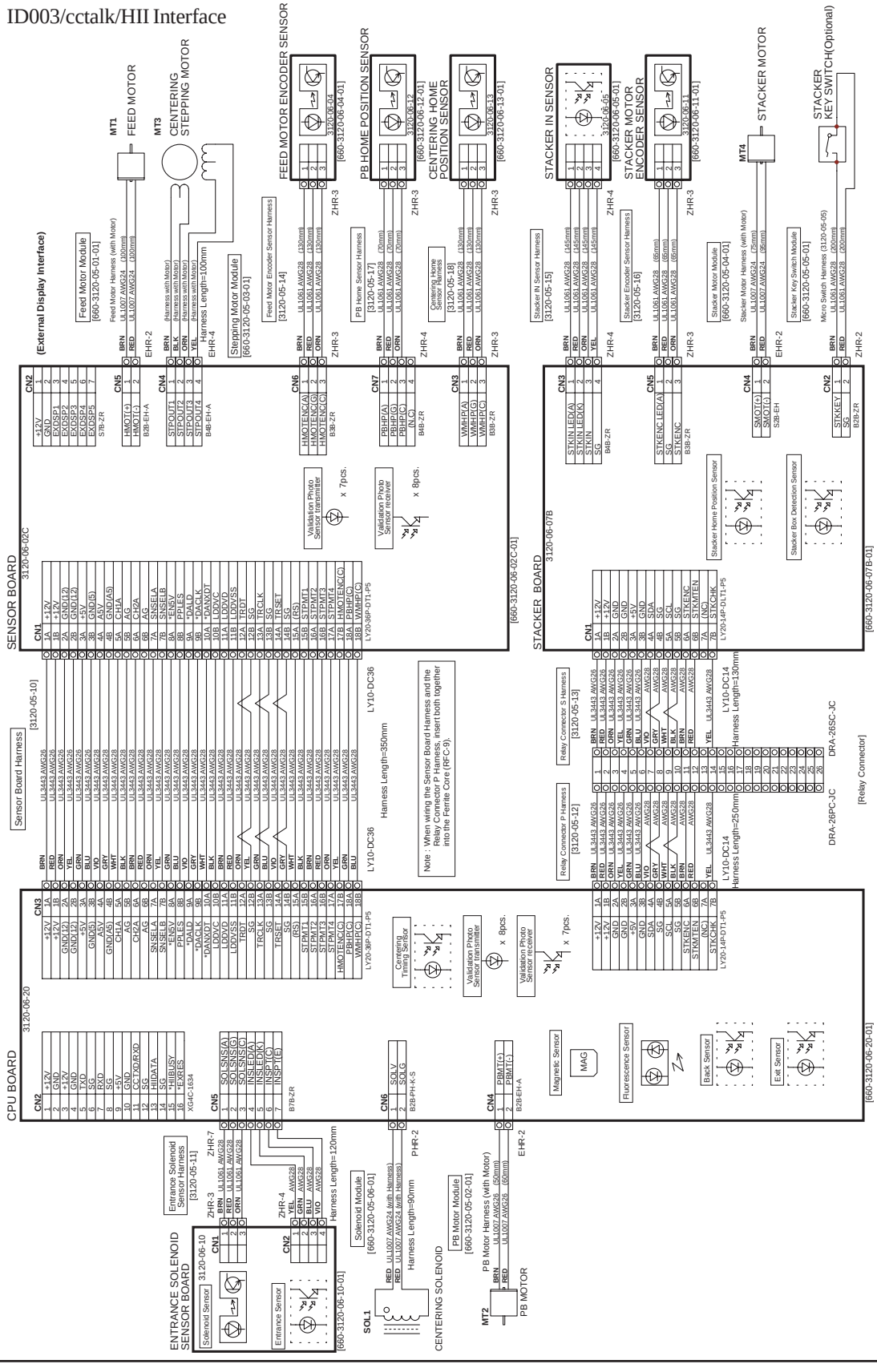


2. EBA-32/33 Wiring Diagram

EBA-32/33 CPU Board

(Power Supply and External Communication Interface)

ID003/cctalk/HII Interface

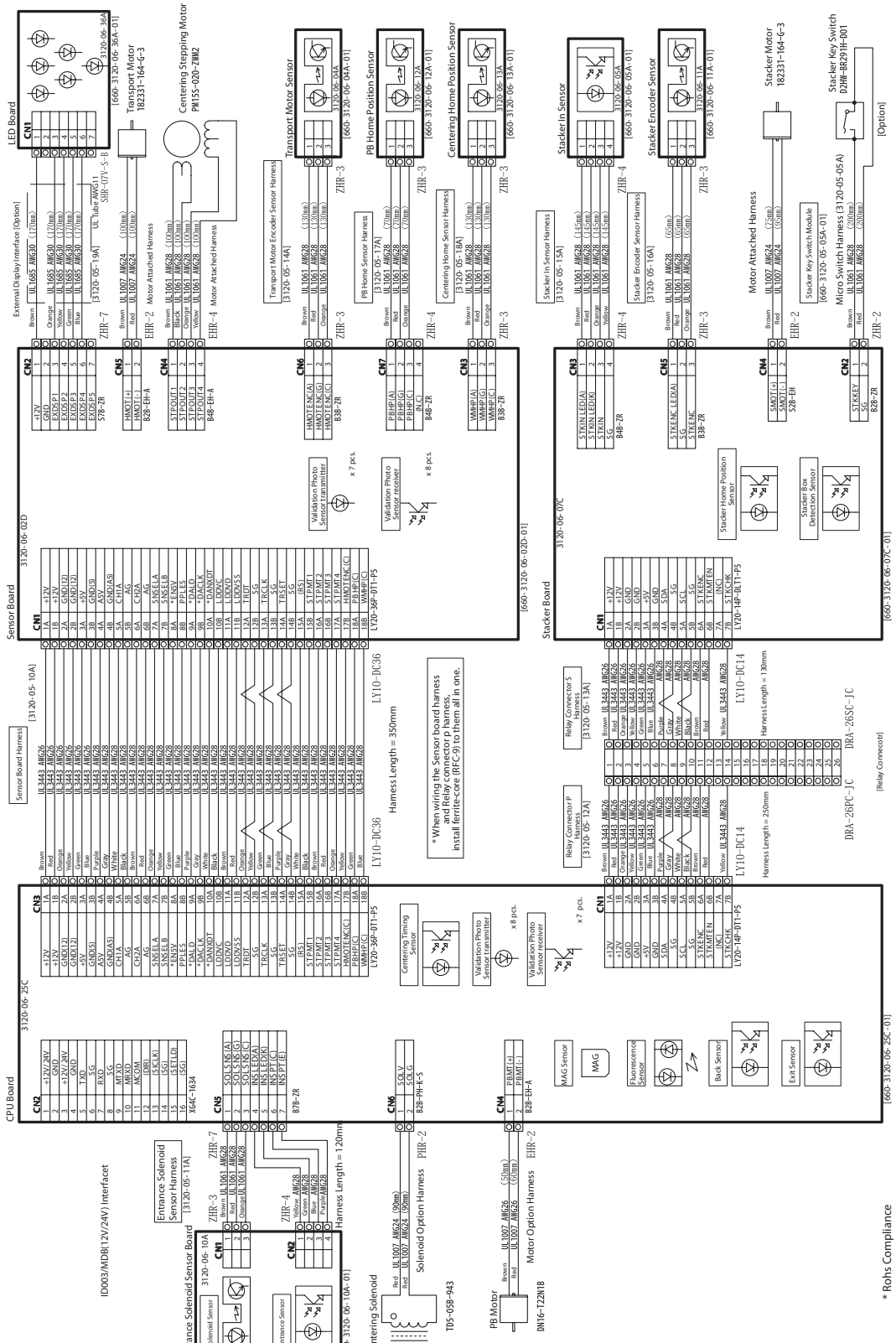


3. EBA-34/35 Wiring Diagram

EBA-34/35 CPU Board

(Power Supply and External Communication Interface)

ID003/MDB(12V/24V)



Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 6

Contents

Trouble Shooting

1.Outline
2.Bill Acceptance Test
3.Error Classification (Mulfunction or Rejection)
4.Trouble Shooting

Issue 01/2006

JAPAN CASHMACHINE CO., LTD.

Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

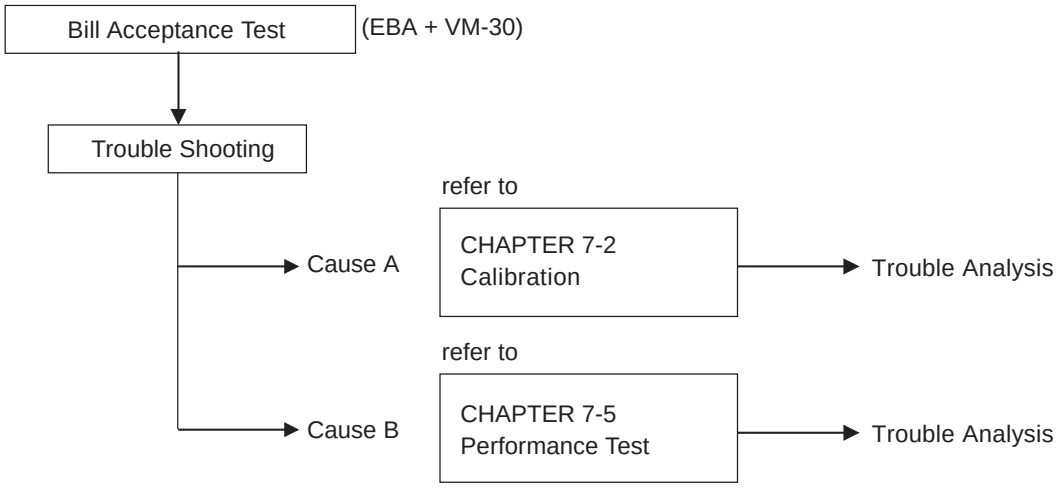
1. Outline

1-1 Introduction

Watch the operation status of acceptor at power-up.
This is important to find the cause of troubles and/or the defective components of the unit.
Many troubles on acceptor are caused by trifling factors. Be sure to check the fundamental factors such as whether harnesses are properly connected without breakage.
When the bill acceptance is not smooth, clean the dirt on the magnetic sensor or blow out paper fibers and other debris on the sensor lenses.

1-2 Detecting errors in test mode

The cause of troubles can be detected by performing bill acceptance test conduct calibration or performance test to repair or replace detective component(s) depending on the type of troubles.

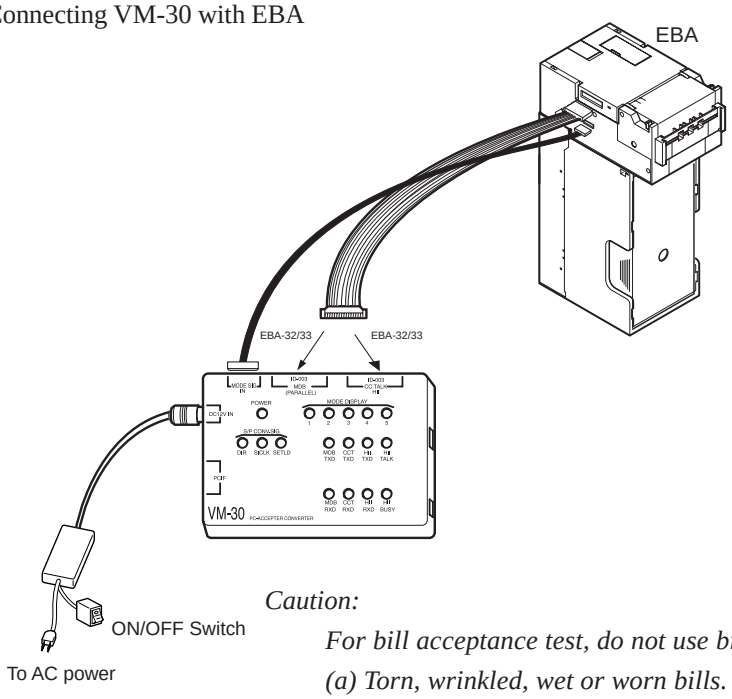


Note:

Whenever acceptor head unit was disassembled for service, be sure to perform calibration.
(See Chapter 7 on page 7-3)

2. Bill Acceptance Test

2-1 Connecting VM-30 with EBA



Caution:

For bill acceptance test, do not use bills in the following conditions.

(a) Torn, wrinkled, wet or worn bills.

(b) Bills with folded corners or edges.

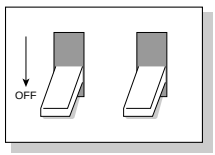
(c) Bills with wrong cutting dimensions and printing displacement.

(d) Bills with oil spots or iron particles

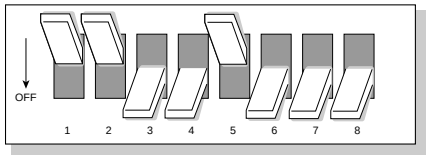
2-2 DIP switch setting of bill acceptance test

(1) Be sure the power of VM-30 is off. Set DIP switches of VM-30 and EBA as shown below:

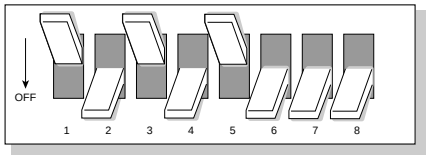
DIP switch of VM-30



DIP switch 1 of EBA



EBA acceptor only
(i.e. without SD3 stacker unit)



EBA with SD3 stacker unit

(2) Turn the VM-30 power on.

Power LED on VM-30, and green LED of EBA light. This is stand-by status of test mode.

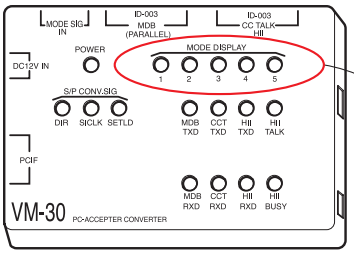
2-4 Starting bill acceptance test

Turn the switch #1 off.

The unit is able to accept bills after initialization.

Check the acceptance rate.

The denominations of bill accepted by EBA is shown by the combinations of VM-30 mode display LEDs.



	Mode Display LEDs of VM-30				
	LED1	LED2	LED3	LED4	LED5
DENOMI 1	✸	○	○	○	○
DENOMI 2	○	✸	○	○	○
DENOMI 3	✸	✸	○	○	○
DENOMI 4	○	○	✸	○	○
DENOMI 5	✸	○	✸	○	○
DENOMI 6	○	✸	✸	○	○
DENOMI 7	✸	✸	✸	○	○
DENOMI 8	○	○	○	✸	○

3. Error Classification (Malfunction or Rejection)

When EBA is unable to accept a bill, LEDs on CPU board blink.
The error status can be determined by the blinking pattern and the number of blinks.

3-1 Bill is not accepted
Red LED blinks, indicating malfunction in the EBA operations.
Check the number of blinks on the red LED, and see Error Code List (Malfunction) on page 6-11.

3-2 Bill is rejected after being accepted
Green LED blinks, indicating the problem on the acceptor's sensor portion.
Check the number of green LED blinks, and see Error Code List (Rejection) on page 6-12.

4. Trouble Shooting

The troubles are mainly categorized into the following 7 conditions:

(1) The power of EBA cannot be turned on.

(2) Test mode cannot be started.

(3) LED on the illuminated bezel does not light.

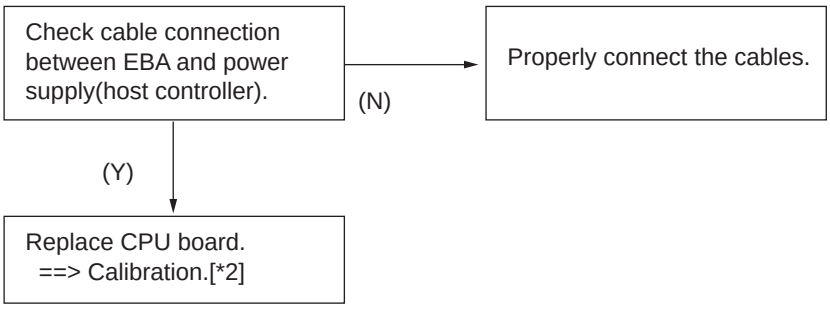
(4) Communication from acceptor to host controller cannot be established.

(5) Bill is rejected or acceptance rate is low.

(6) Bill transport is not smooth.

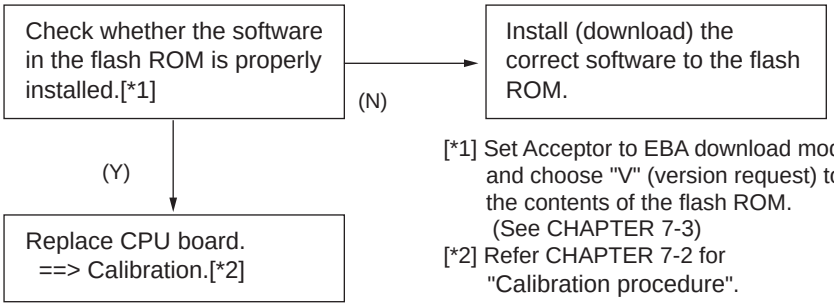
(7) Bill is not accepted.

4-1 The power is not turned on



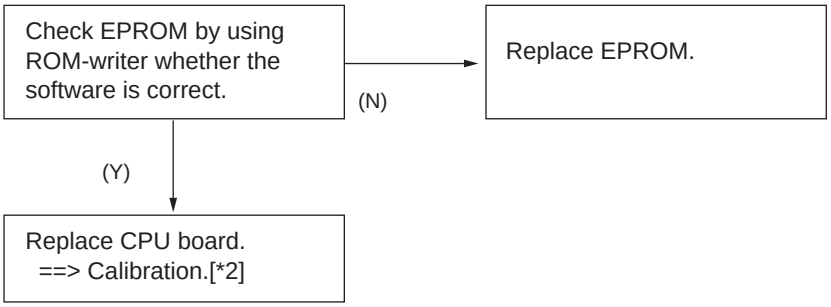
4-2 Test Mode cannot be started

(a) EBA-30/32 (flash ROM)


Check whether the software in the flash ROM is properly installed.[*1]
(N)
Install (download) the correct software to the flash ROM.
(Y)
Replace CPU board.
==> Calibration.[*2]

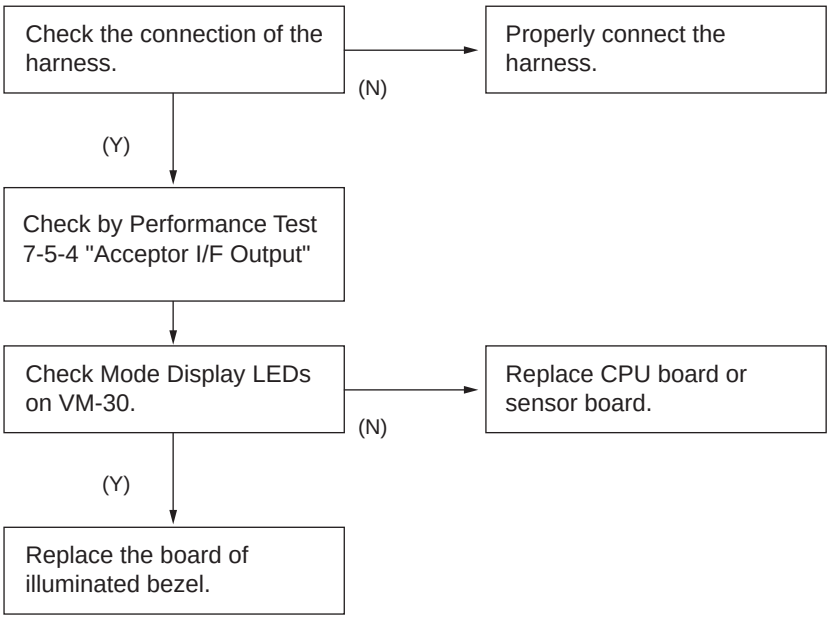
[*1] Set Acceptor to EBA download mode, and choose "V" (version request) to confirm the contents of the flash ROM. (See CHAPTER 7-3)
[*2] Refer CHAPTER 7-2 for "Calibration procedure".

(b) EBA-31/33(EPROM)

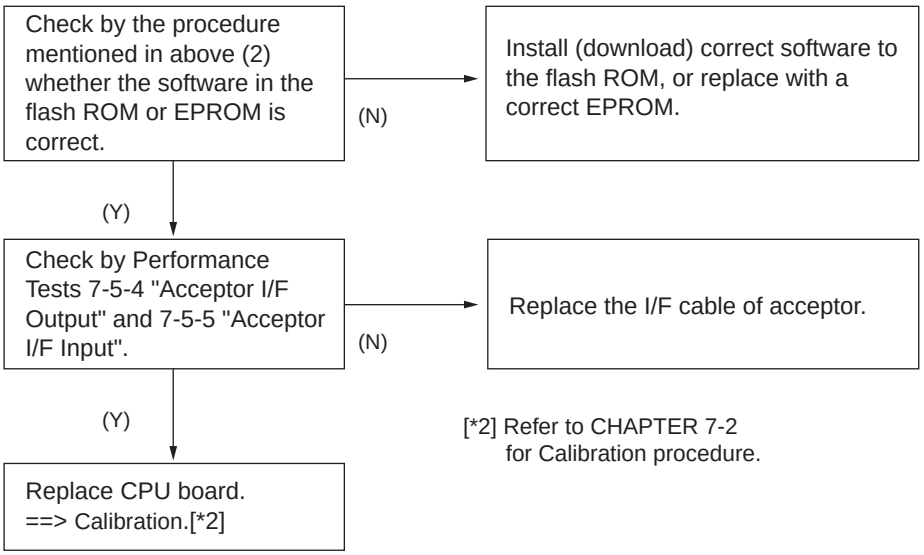


4-3 LEDs on the illuminated bezel does not light.

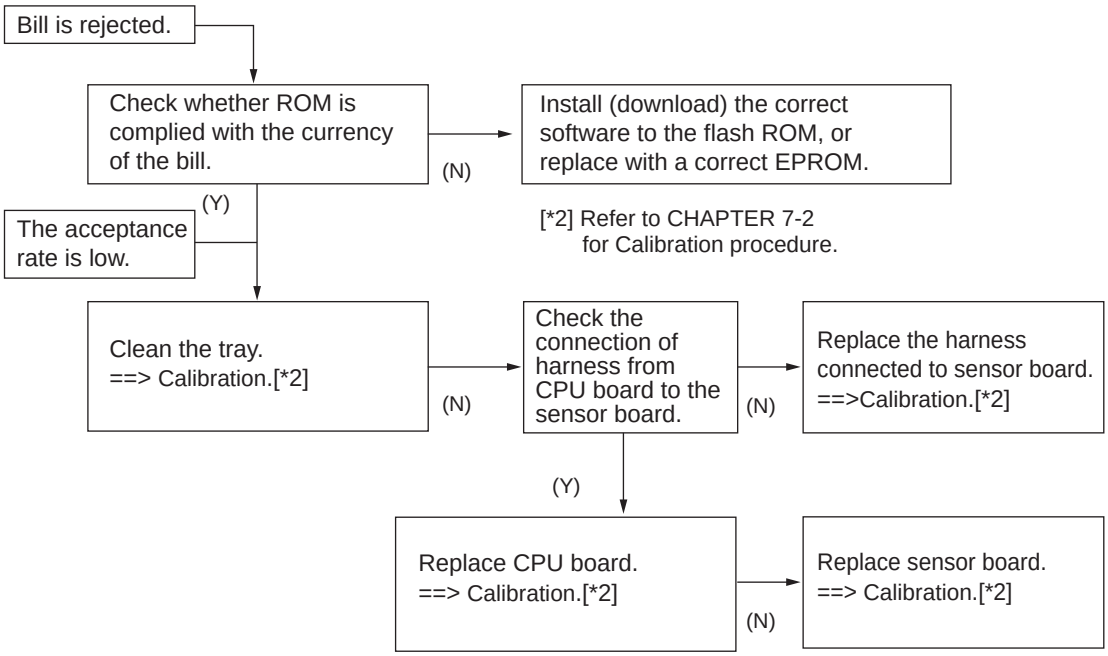
<Note> The LEDs on the illuminated bezel do not blink during the bill acceptance test.


Check the connection of the harness.
(N)
Properly connect the harness.
(Y)
Check by Performance Test 7-5-4 "Acceptor I/F Output"
Check Mode Display LEDs on VM-30.
(N)
Replace CPU board or sensor board.
(Y)
Replace the board of illuminated bezel.

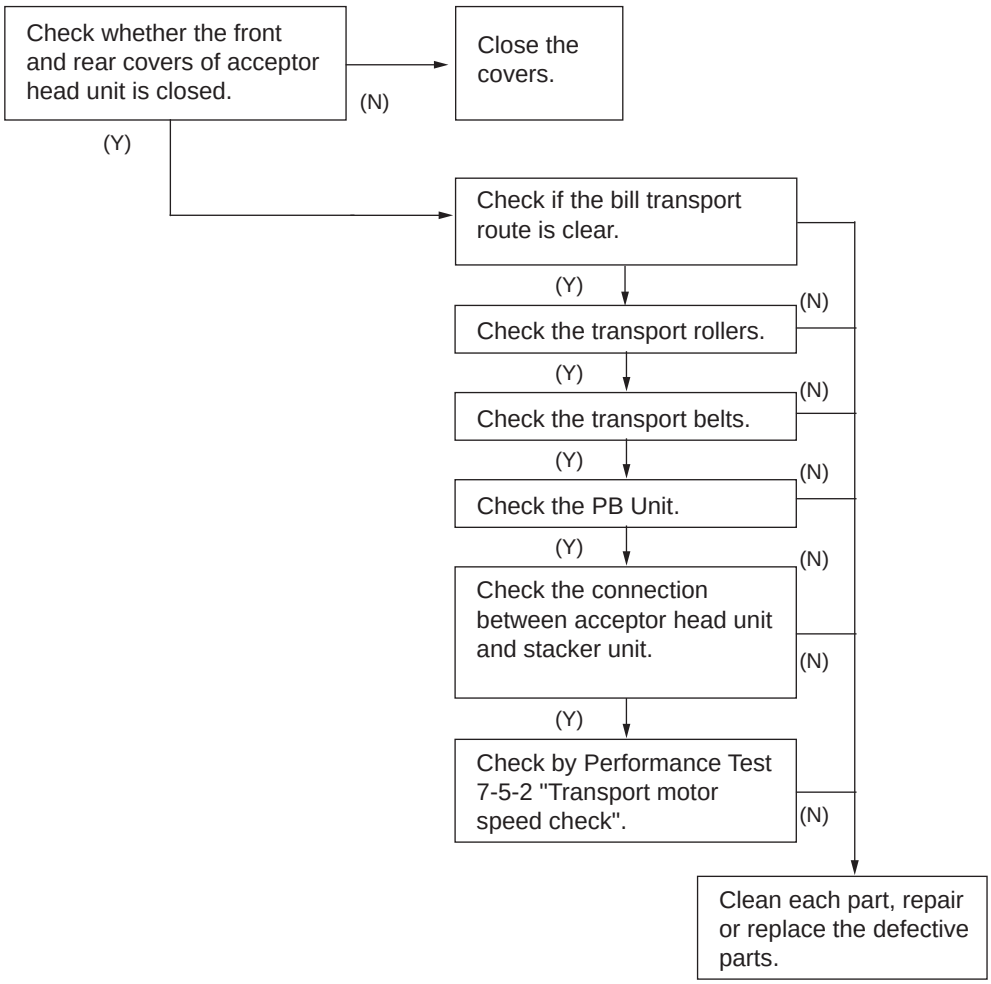
4-4 Communication between acceptor and host controller cannot be established.


Check by the procedure mentioned in above (2) whether the software in the flash ROM or EPROM is correct.
(N)
Install (download) correct software to the flash ROM, or replace with a correct EPROM.
(Y)
Check by Performance Tests 7-5-4 "Acceptor I/F Output" and 7-5-5 "Acceptor I/F Input".
(N)
Replace the I/F cable of acceptor.
(Y)
[*2] Refer to CHAPTER 7-2 for Calibration procedure.
Replace CPU board. ==> Calibration.[*2]

4-5 Bill is rejected or the bill acceptance rate is low. Green LED blinks.

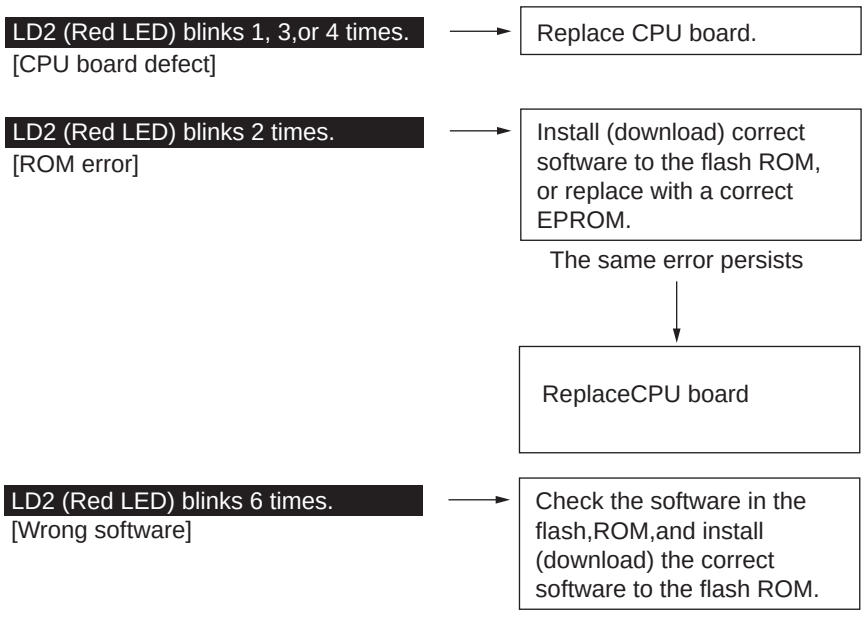

Bill is rejected.
Check whether ROM is complied with the currency of the bill.
(N)
Install (download) the correct software to the flash ROM, or replace with a correct EPROM.
(Y)
[*2] Refer to CHAPTER 7-2 for Calibration procedure.
The acceptance rate is low.
Clean the tray. ==> Calibration.[*2]
(N)
Check the connection of harness from CPU board to the sensor board.
(N)
Replace the harness connected to sensor board. ==>Calibration.[*2]
(Y)
Replace CPU board. ==> Calibration.[*2]
(N)
Replace sensor board. ==> Calibration.[*2]

4-6 Bill transport is not smooth, or bill stops on the way.



4-7 Bill is not accepted

(a) Green LED lights, and Red LED blinks


LD2 (Red LED) blinks 1, 3,or 4 times.
[CPU board defect]
Replace CPU board.
LD2 (Red LED) blinks 2 times.
[ROM error]
Install (download) correct software to the flash ROM, or replace with a correct EPROM.
The same error persists
ReplaceCPU board
LD2 (Red LED) blinks 6 times.
[Wrong software]
Check the software in the flash,ROM,and install (download) the correct software to the flash ROM.

(b) Green LED is off, and Red LED blinks

LD2 (Red LED) blinks once.
[Stacker box is full, or the movement of pusher mechanism is slow.]

Check whether the stacker unit is full. → (not full) → Check by Performance Test 7-5-11 "Stacker Stacking Test"

LD2 (Red LED) blinks twice. → Check by Performance Test 7-5-11 "Stacker Stacking Test"
[Pusher mechanism failure.]

LD2 (Red LED) blinks 3 times. → Check by the Performance Tests 7-5-10 "Test for Stacker Sensor Test" and/or 7-5-12 "Acceptor only or Acceptor +Stacker Aging Test."
[Failure of stacker's transport route.]

LD2 (Red LED) blinks 4 times. → Check by the Performance Tests 7-5-3 "Acceptor bill detection sensor ON/OFF test" and/or 7-5-12 "Acceptor only or Acceptor +Stacker Aging Test."
[Failure of acceptor head unit's transport route.]

LD2 (Red LED) blinks 5 times, after the initialization oh motor. → Check by Performance Test 7-5-2 "Test of normal rotation & reverse rotation of transport motor in acceptor."
[Transport motor failure.]

LD2 (red LED) blinks 5 times, during calibration or before the initialization starts after power-up. → Replace CPU board.
[EEPROM failure.]

LD2 (Red LED) blinks 6 times. → Check by Performance Test 7-5-2 "Test of normal rotation & reverse rotation of transport motor in acceptor."
[Transport motor failure.]

LD2 (Red LED) blinks 9 times. → Check by Performance Test 7-5-7 "PB Unit Test".
[PB unit failure.]

LD2 (Red LED) blinks 10 times.
[No stacker box or the failure of stacker box detecting sensor.]

Check whether the stacker box placed in the position. → Check by Performance Test 7-5-10 "Stacker Sensor Test".

LD2 (Red LED) blinks 11 times.
[Connection failure between acceptor head unit and stacker unit]

→ Check by Performance Test 7-5-10 "Stacker Sensor Test".

LD2 (Red LED) blinks 13 times.
[Centering mechanism failure]

→ Check by Performance Test 7-5-8 "Centering Mechanism Test".

LD2 (Red LED) blinks 14 times.
[Failure of centering mechanism solenoid]

→ Check by Performance Test 7-5-9 "Solenoid Test".

LD2 (red LED) blinks 15 times.
[The key of stacker unit is unlocked, on the failure of stacker box key switch]

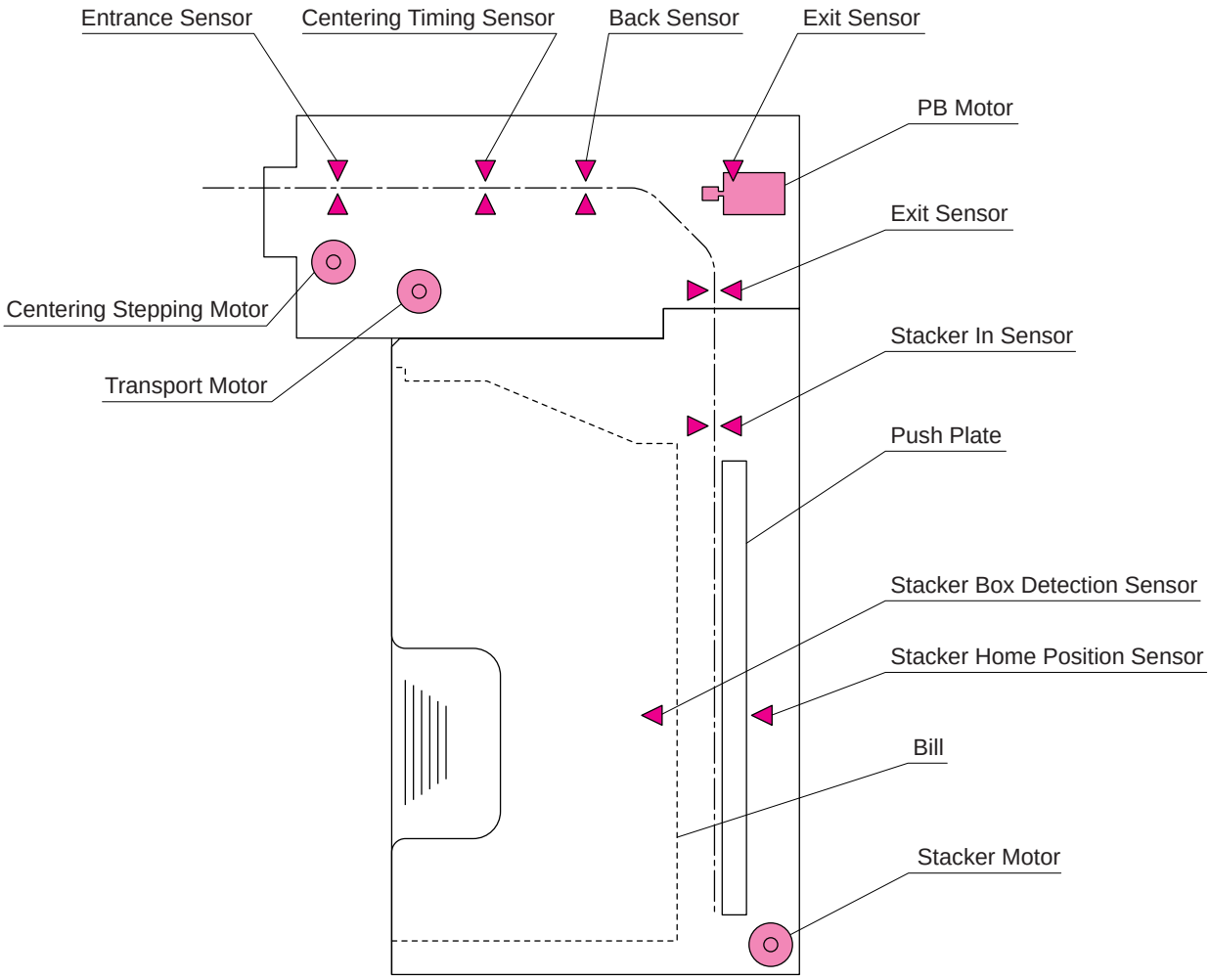
↓

Check whether the box key is locked.

→ (locked) Check by Performance Test 7-5-10 "Stacker Sensor Test".

LD2 (Red LED) blinks 16 times.
[Acceptor head unit is detached from stacker unit]

→ Check the connection between acceptor head unit and stacker unit.


Entrance Sensor
Centering Timing Sensor
Back Sensor
Exit Sensor
PB Motor
Exit Sensor
Centering Stepping Motor
Transport Motor
Stacker In Sensor
Push Plate
Stacker Box Detection Sensor
Stacker Home Position Sensor
Bill
Stacker Motor

- Malfunction Error

Number of Red LED Blinking	Number of Green LED Blinking	Failure Description
1		Boot ROM error.
2		1. Incorrect contents of External ROM, or empty program. 2. Does not write program to external ROM (Flash ROM).
3		Internal ROM (CPU) error.
4		External RAM error.
6		Download file error.
1	– – – – –	1. Stacker full. 2. Stacker pushing mechanism is jammed.
2	– – – – –	1. Stacker pushing mechanism is jammed. 2. Stacker home position sensor is jammed. 3. Stacker encoder signal error.
3	– – – – –	Bill is jammed at stacker section.
4	– – – – –	Bill is jammed at acceptor head unit section.
5	– – – – –	1. Feed motor (Acceptor head unit section) speed is slower or faster. 2. EEPROM error.
6	– – – – –	1. Feed motor (Acceptor head unit section) is jammed. 2. Does not rotated motor. 3. Does not stop motor. 4. Encoder signal from feed motor is jammed.
9	– – – – –	1. PB unit error. 2. Does not rotated motor. 3. Does not stop motor. 4. Encoder signal from PB unit is jammed.
10	– – – – –	1. No cash box in stacker. 2. Box detection sensor error.
11	– – – – –	Connection error with stacker section.
12	– – – – –	Sensor turned on to the timing which is operation and is not obtained.
13	– – – – –	1. Centralization mechanism is jammed. 2. Does not rotated motor of centralization mechanism. 3. Home position sensor of press unit is jammed.
14	– – – – –	1. Solenoid of centering mechanism is jammed. 2. Does not operated solenoid of centering mechanism. 3. Home position sensor of solenoid is jammed.
15	– – – – –	1. Released box key. 2. Switch of box key is in malfunction.
16	– – – – –	Removed acceptor head unit from stacker unit.

- Rejecting Error

Number of Red LED Blinking	Number of Green LED Blinking	Failure Description
– – – – –	1	Slanting insertion detection
– – – – –	2	Magnetic sensor pattern error
– – – – –	3	Remains detection error
– – – – –	4	Optical sensor error 1
– – – – –	5	Bill feed error
– – – – –	6	Bill judgement error
– – – – –	7	Optical sensor error 2
– – – – –	8	Optical sensor error 3
– – – – –	9	Reject Inhibited bill error
– – – – –	10	Reject bill by rejection command
– – – – –	13	Bill length error
– – – – –	14	Optical sensor error 4
– – – – –	15	Optical sensor error 5
– – – – –	16	Optical sensor error 6
– – – – –	17	Optical sensor error 7

Bill Acceptor

EBA-30/31-SD3(EBA-30/31)
EBA-32/33-SD3(EBA-32/33)
EBA-34/35-SD3(EBA-34/35)

CHAPTER 7

Contents

Calibration / Downloading to Flash Memory / Diagnostics

1. VM-30 Descriptions
2. Calibration
3. Downloading software to Flash Memory
4. Writing Serial Number
5. Diagnostics

Issue 01/2006

JAPAN CASHMACHINE CO., LTD.

Copyright © 1998 Japan Cash Machine Co.Ltd. All rights reserved.

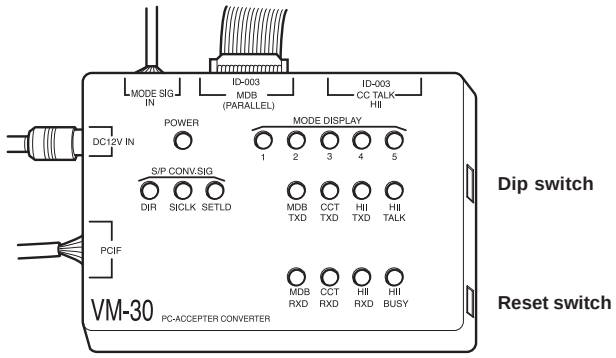
1. VM-30 Descriptions

VM-30 is the I/F Test Bench and AC/DC converter for the EBA-3x series.

WHEN TO USE VM-30

- Calibration
- Downloading software to flash memory
- Writing Serial Number to EEPROM (ID-0E3 only)
- Diagnostics
- Whenever connection of EBA with PC is necessary

VM-30 Part Names and Functions



1-1 Connectors (total 5 connectors)

(1) PCIF

For connection with PC

The VM30 needs to be connected with PC in case of calibration, program download, and operation with I/F simulators for PC.

(2) DC12V IN

For connection with AC adapter

(3) MODE SIG IN

For connection with the external display connector on the side of EBA-30 unit (see Chapter 1 page 1-4)

Use this connector for Diagnostics.

(4) ID-003 / MDB / (PARALLEL)

For connection with EBA-30/31/34/35 unit.

(5) ID-003 / ccTalk / HII

For connection with EBA-32/33 unit.

1-2 Switches (total 6 switches)

(1) MDB RXD

(2) CCT RXD

(3) HII RXD

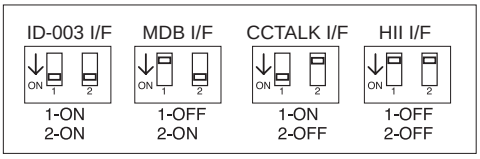
(4) HII BUSY

These 4 switches should be used only in case of “Acceptor I/F Output Test” and “Acceptor I/F Input Test” during test mode. Do not use these switches in other cases.

(5) DIP Switch (on side)

Used for I/F selection. Refer to the table below for appropriate settings.

Be sure to set the switches prior to power-up.



(6) Reset Switch (on side)

Hard reset switch

Effective only for EBA-32/33

1-3 LED (total 13 LEDs)

(1) POWER

Lights when the VM30 power is on.

(2) DIR

(3) SICLK

(4) SETLD

These 3 LEDs display the communication status with a parallel I/F conversion board (to be developed). The LEDs flash in case of “Acceptor I/F Output Test” during test mode.

(5) MODE DISPLAY 1 - 5

LEDs for external display (ex. Faceplate). These LEDs are enabled by connecting the unit to the MODE SIG IN connector.

(6) MDB TXD

Indicator of the transmission status of acceptor’s ID-0D3 (MDB) I/F. It lights / flashes during “Acceptor I/F Output Test” and “Acceptor I/F Input Test” of test mode.

(7) CCT TXD

Indicator of the transmission status of acceptor’s ID-0E3 (ccTalk) I/F. It lights / flashes during “Acceptor I/F Output Test” and “Acceptor I/F Input Test” of test mode.

(8) HII TXD

(9) HII TALK

Indicator of the transmission status of acceptor’s ID-0F3 (HII) I/F. These LEDs light / flash during “Acceptor I/F Output Test” and “Acceptor I/F Input Test” of test mode.

2. Calibration

Calibration sets a starting reference point for all the optical and magnetic sensors within the unit.

WHEN TO CALIBRATE

- After the acceptor component has been disassembled
- After the sensor and/or CPU board has been replaced
- Whenever bill acceptance is degraded
- Once a year

TOOLS NEEDED

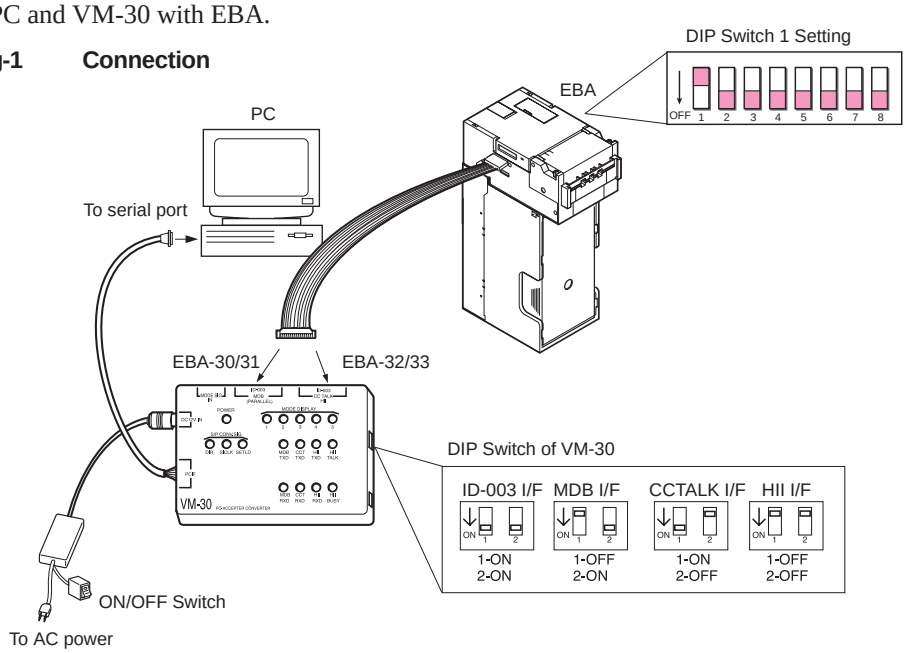
- PC (with RS-232C serial port, OS: MS-DOS/Windows98/2000/ME/XP)
- Power Supply unit VM-30 (Part#093895)
- Calibration Program
  - E30A-xxx.exe(MS-DOS/Windows98/2000/ME/XP)
  - AdjMenu.exe (Windows98/2000/XP))
- White Reference Paper KS-056 (Part#092110)
- Black Reference Paper KS-057 (Part#092123)
- Mag Tool (Part#059318)

Please remove the Face Plate before calibrate the Bill Validator.

2-1 Setting

(1) Connect PC and VM-30 with EBA.

Fig-1 Connection



(2) Turn the PC power ON.

(3) Start the calibration program by selecting either method A, B or C below.

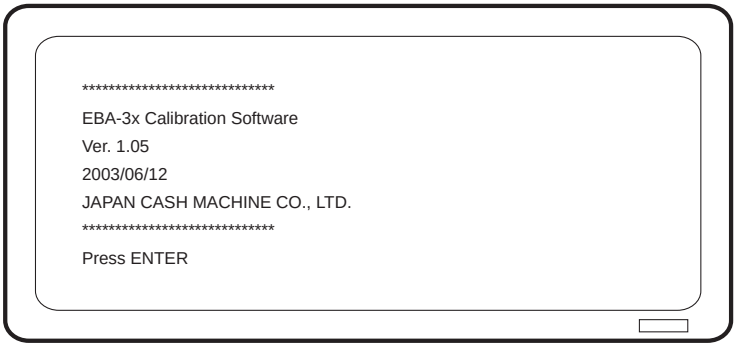
A] When using E30A-xxx.exe on MS-DOS.

1) Start MS-DOS. See your PC and MS-DOS manuals to find out how to start MS-DOS.
2) Insert a floppy disk containing E30A-xxx.exe to your PC's floppy drive.
3) Change the current drive to the drive in which you have inserted the floppy disk (if it is A drive, enter A.)
4) To start calibration, input "E30A-xxx(file name)" and press [Enter].

B] When using E30A-xxx.exe on Windows98/2000/ME/XP

1) Start Windows98/2000/Me/XP.
2) Copy the E30A-xxx.exe to your PC.
3) Double-click the E30A-xxx.exe to start the calibration.

Fig-2



(4) When the Fig-2 appears on the screen, set the VM-30 DIP switches in accordance with the communication interface (see Fig-1 on page 7-3).
(5) Set the switch #1 of DIP Switch 1 (of EBA) ON
(6) Turn on the power of VM-30. Power indication LED of VM-30 turns on.
(7) Press [Enter]. The following screen appears.

Fig-3

To start calibration, press [Enter]. To exit the program, press [Esc].

(8) The program starts erasing the EEPROM (NV memory) of EBA.

Fig-4

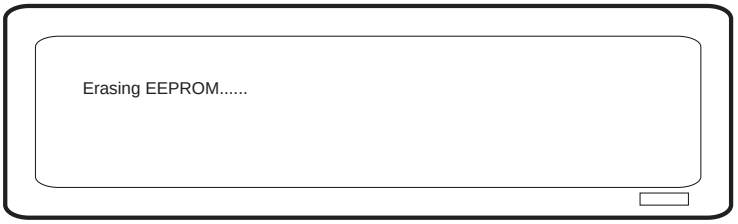
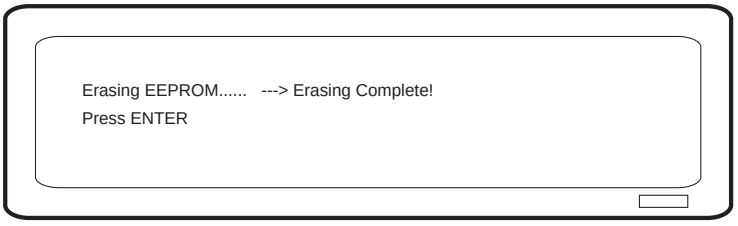


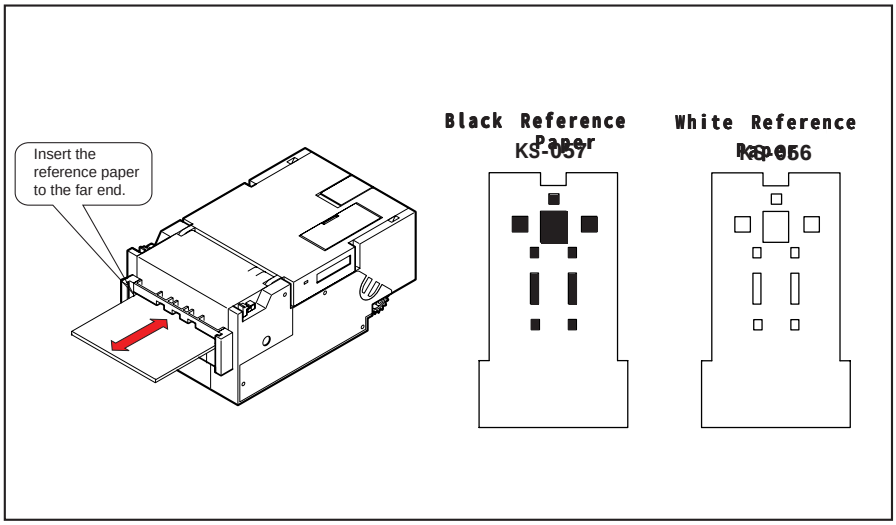
Fig-5



(9) Press [Enter] to continue.

2-2 Calibrating Optical Sensors

Fig-6 Setting reference paper



(1) Insert Black Reference Paper (KS-057). Press [Enter].

Fig-7

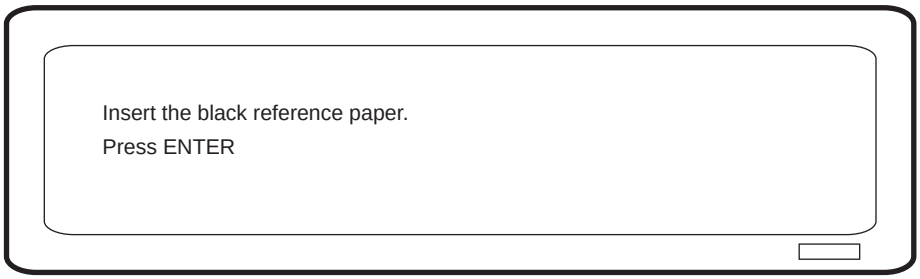
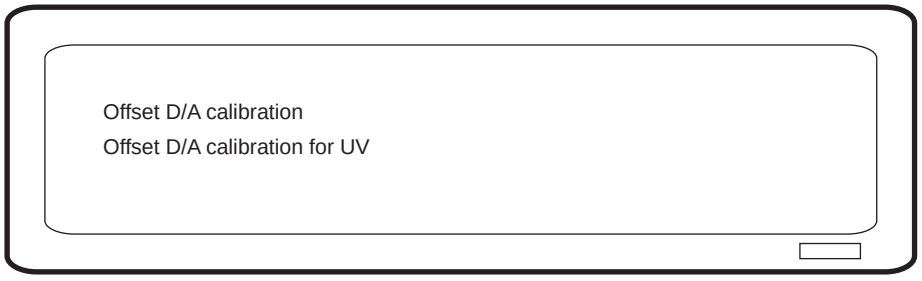


Fig-8



(2) Remove Black Reference Paper (KS-057), and insert White Reference Paper (KS-056). Press [Enter].

Fig-9

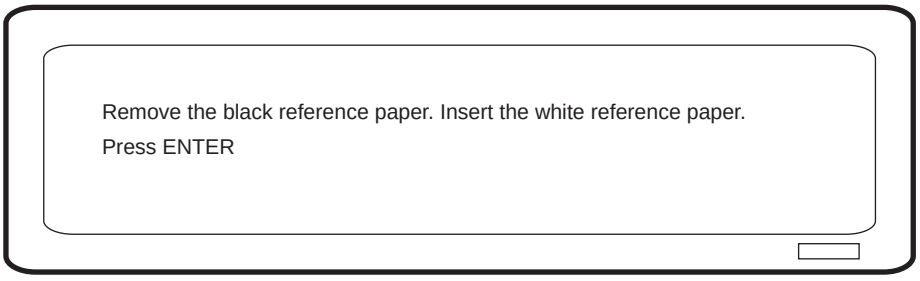
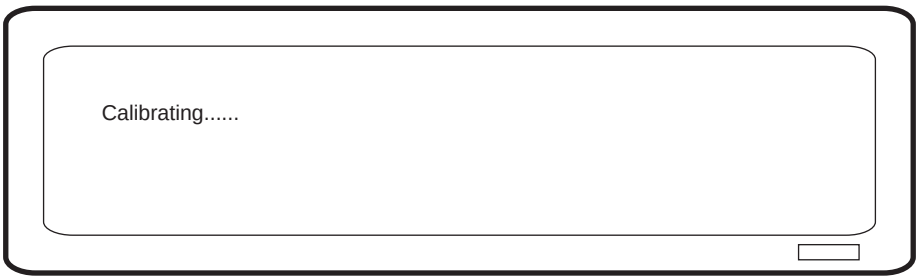


Fig-10



(3) When the Fig-11 appears, press "Enter". The UV sensor calibration starts.

Fig-11

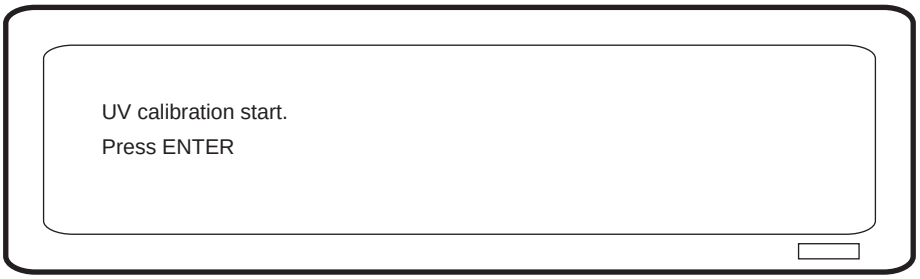
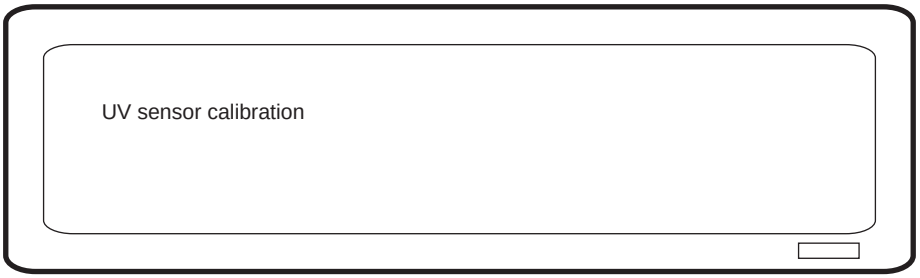


Fig-12



(4) When the Fig-13 appears, remove White Reference Paper (KS-056). Insert Black Reference Paper (KS-057) again, and press [Enter].

Fig-13

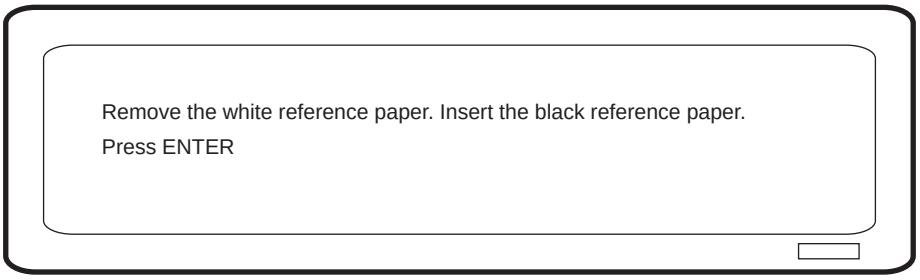
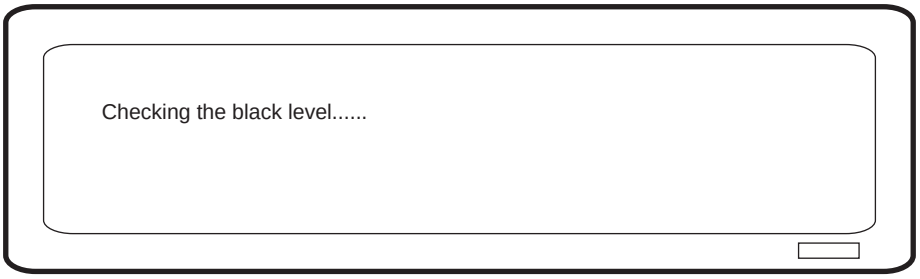


Fig-14



(5) When the Fig-15 appears, remove Black Reference Paper (KS-057), and press [Enter].

Fig-15

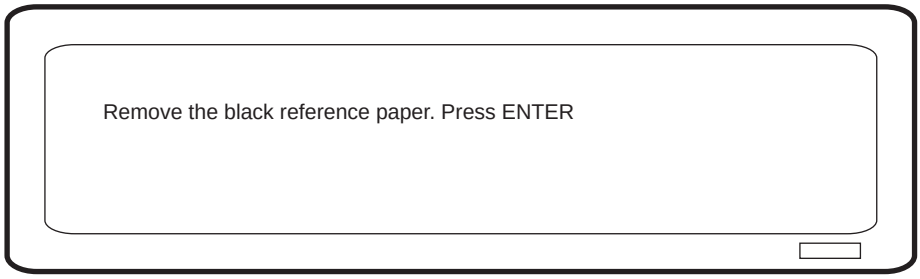
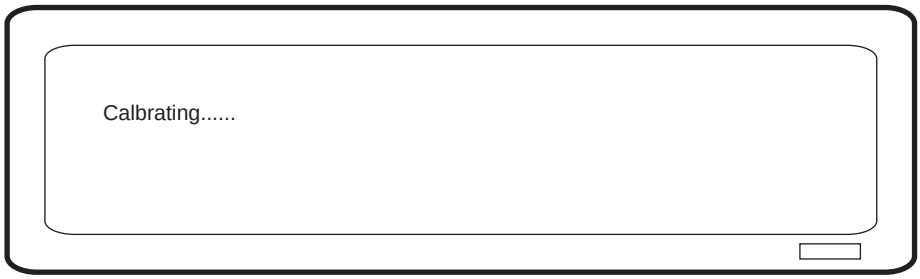


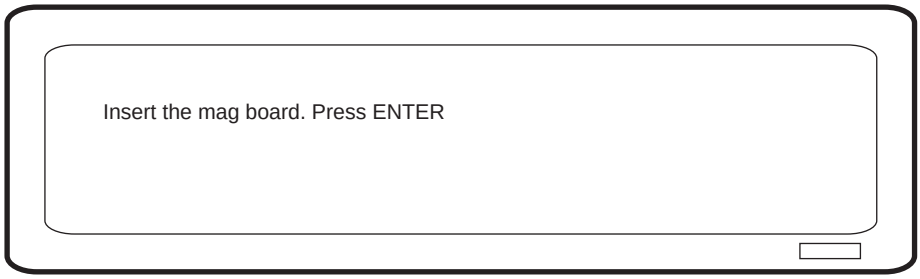
Fig-16



2-3 Calibrating Magnetic Sensor

When the calibration of optical sensors is complete, the Fig-17 appears. Continue with the calibration of magnetic sensor.

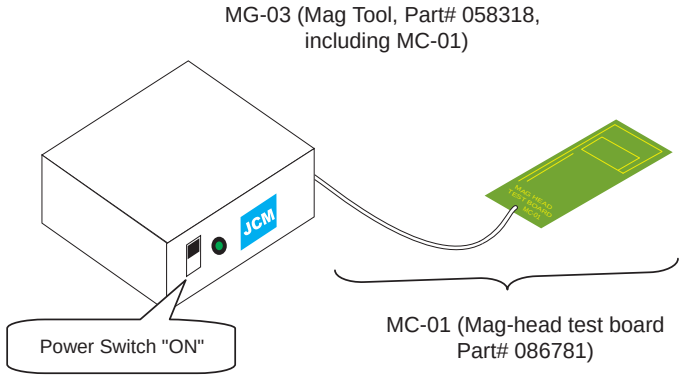
Fig-17



(1) Prepare Mag Tool (MG-03).

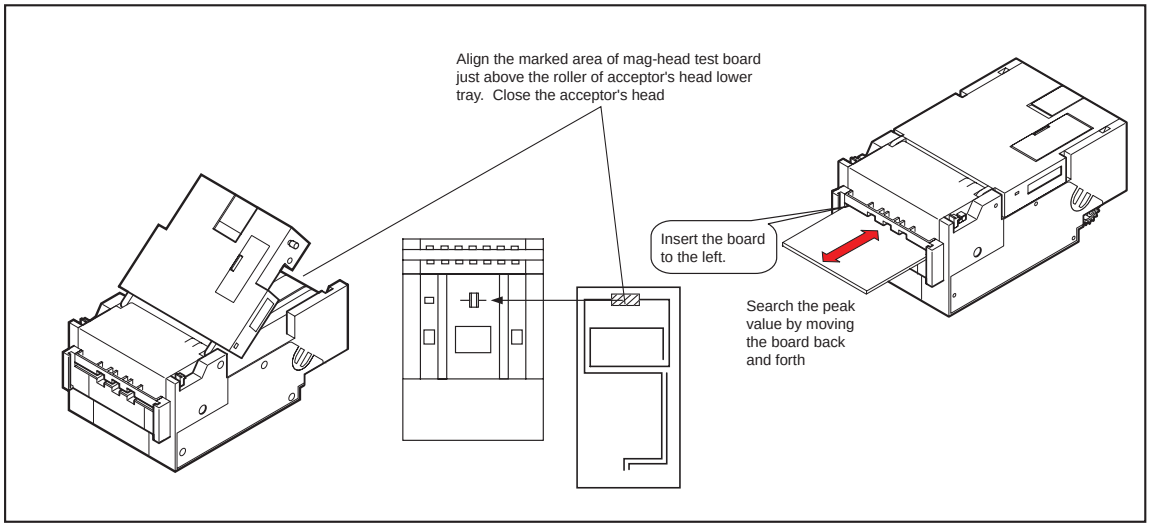
(2) Turn the power of MG-03 ON.

Fig-18 Preparation



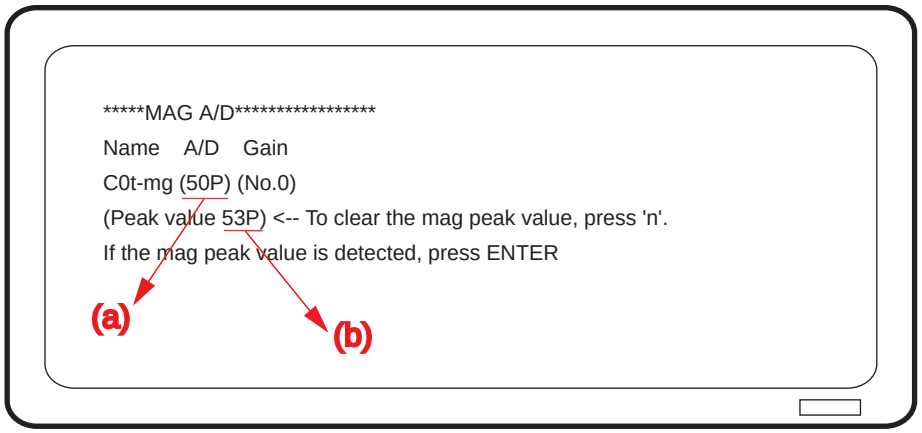
(3) Insert Mag-head test board (MC-01) to EBA as shown in the diagram below. Press [Enter].

Fig-19


Align the marked area of mag-head test board just above the roller of acceptor's head lower tray. Close the acceptor's head
Insert the board to the left.
Search the peak value by moving the board back and forth

(4) The following screen appears. (a) shows the current value, and (b) shows the peak value detected after the mag-head test board has been inserted. Slowly move the mag-head test board back and forth to find the peak value.

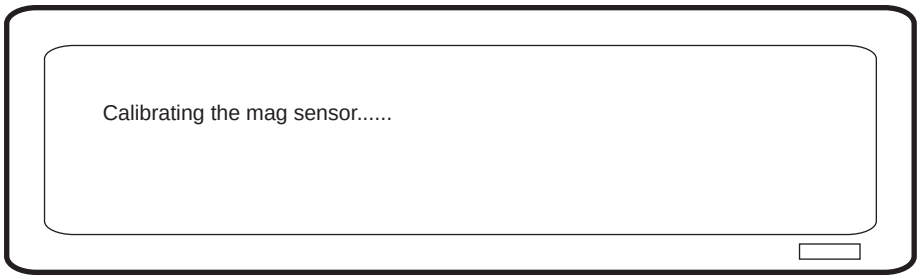
Fig-20


*****MAG A/D*****
Name A/D Gain
C0t-mg (50P) (No.0)
(Peak value 53P) <-- To clear the mag peak value, press 'n'.
If the mag peak value is detected, press ENTER
(a)
(b)

(5) Continue to move slowly the mag-head test board back and forth several millimeters to find the position where the "Cot-mg" value enters the range within 5P in relation to the peak value (the "Cot-mg" value should be more than 30P.)
Press [ENTER] to continue.

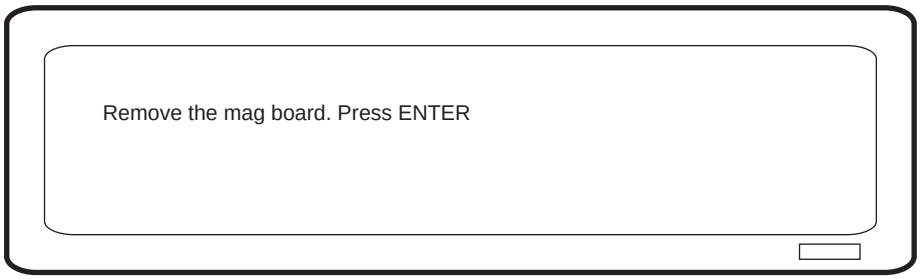
(6) When the following screen appears, the Magnetic Sensor calibration starts.

Fig-21



(7) When the calibration is complete, remove the mag-head test board. Press [Enter].

Fig-22



2-4 Checking the motor speed (this process is automatically started).

Fig-23

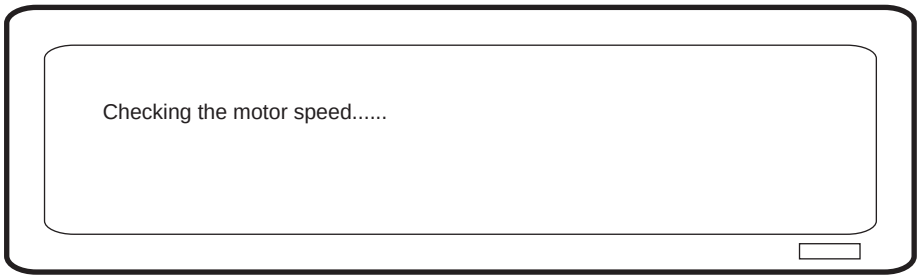
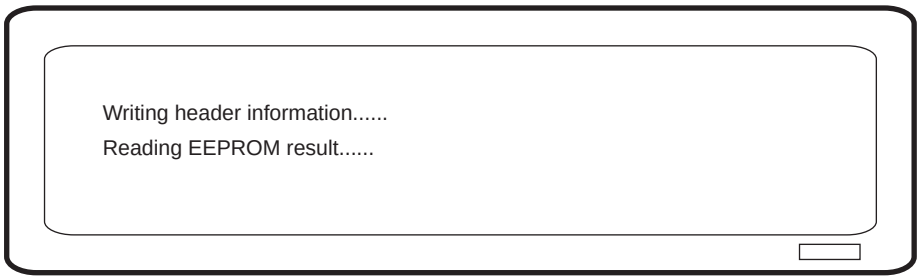


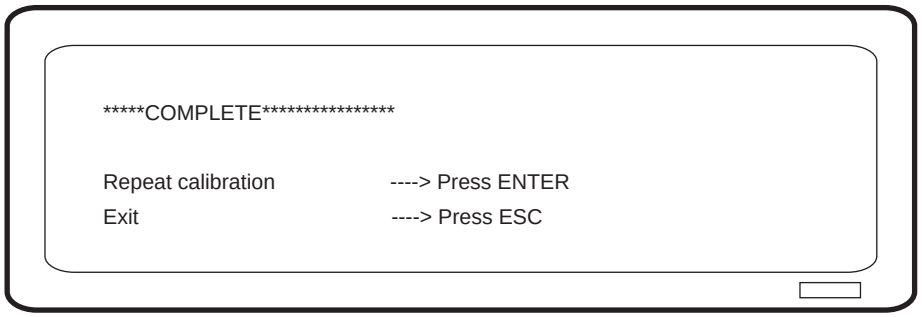
Fig-24



2-5 End of CalibrationWhen the following screen appears, all calibration procedures are completed. If you wish to continue to calibrate the other unit, press [Enter] and connect the cable with the other unit.

To end calibration, press [Esc] to exit the program.

Fig-25



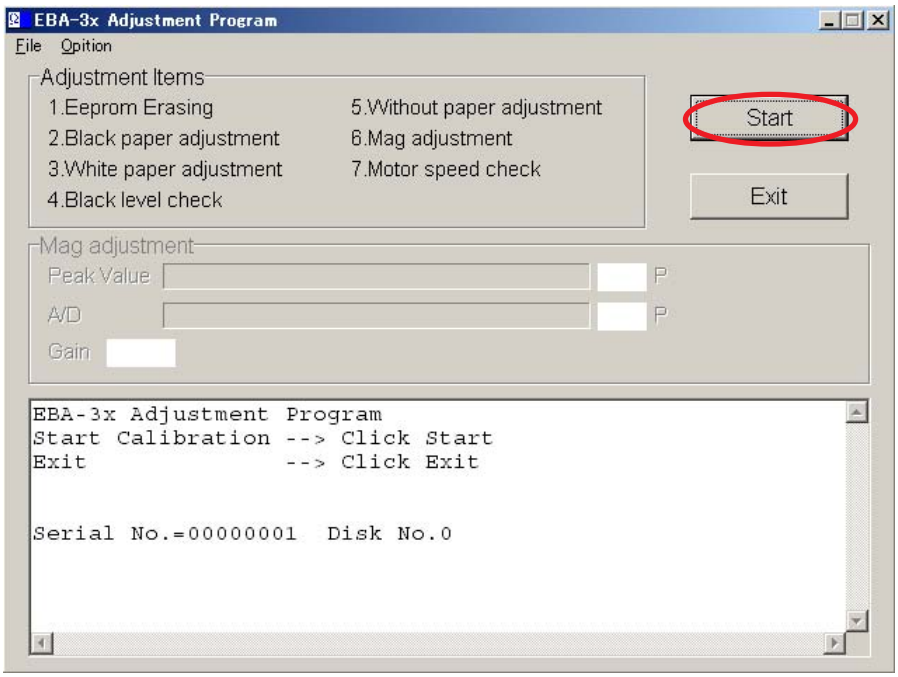
C] When using AdjMenu.exe on Window98/2000/XP.

1) Start Windows98/2000/XP.
2) Double click AdjMenu.exe to start the calibration program. Then the following window will appear (See Fig-26). Click the [EBA-30/32] button to start EBA-3X Adjustment Program.

Fig-26

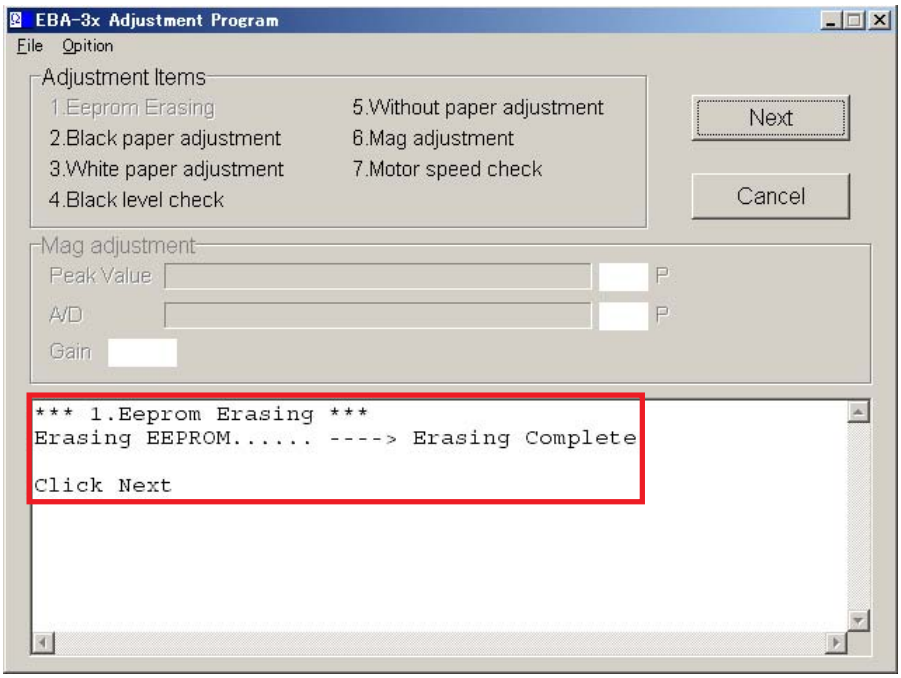
3) Then the following window will appear (See Fig-27). Click the [Start] button to start adjustment.

Fig-27



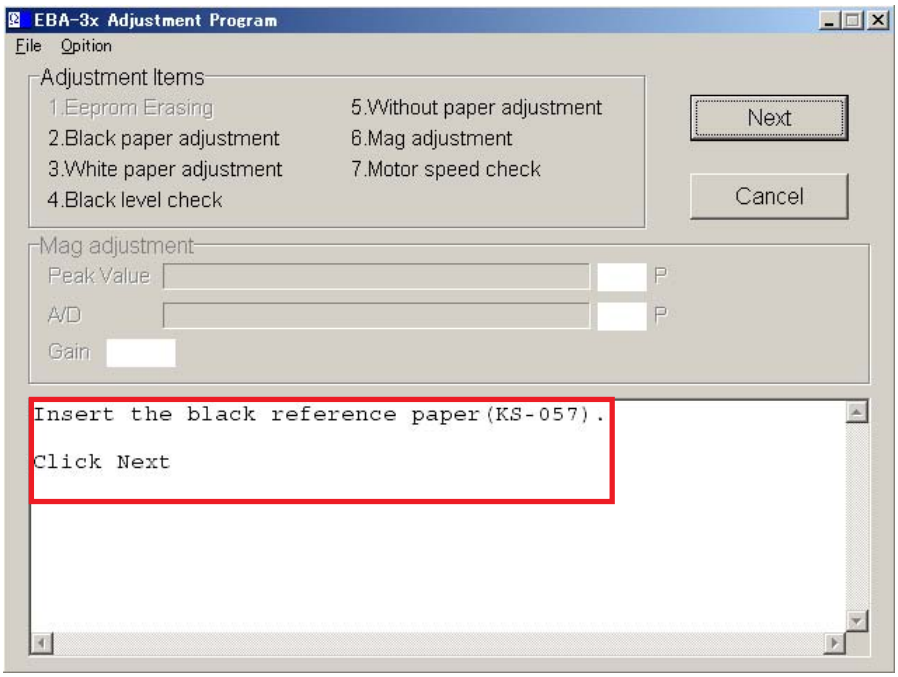
4) After completed Eeprom Erasing, The following message will appear in the status box (See Fig-28). Click the [Next] button.

Fig-28



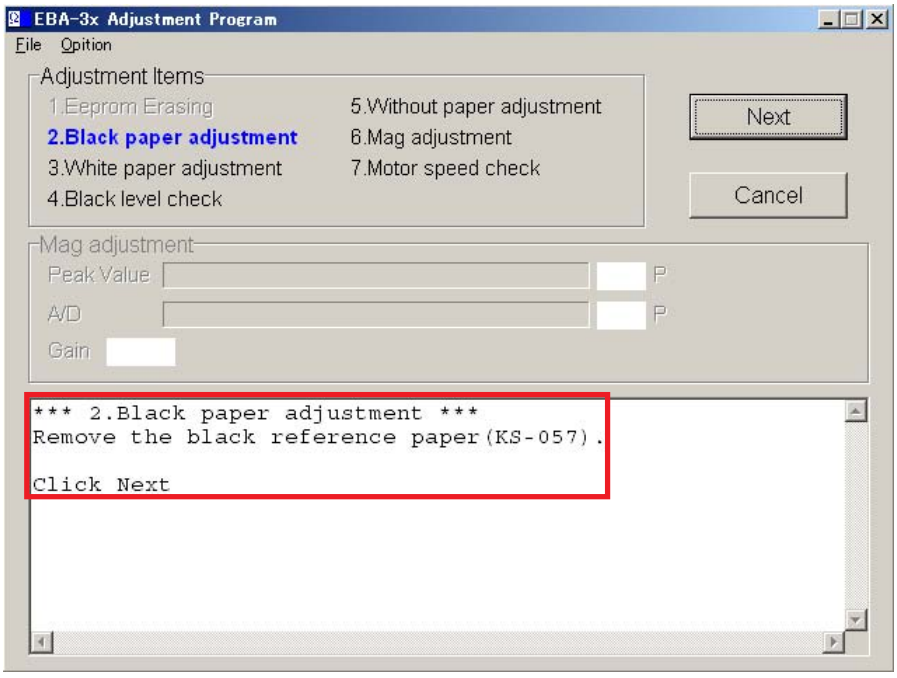
5) Then the following message will appear (See Fig-29). Insert the black reference paper to EBA-3X unit and press [Next] button to start the Black paper adjustment.

Fig-29



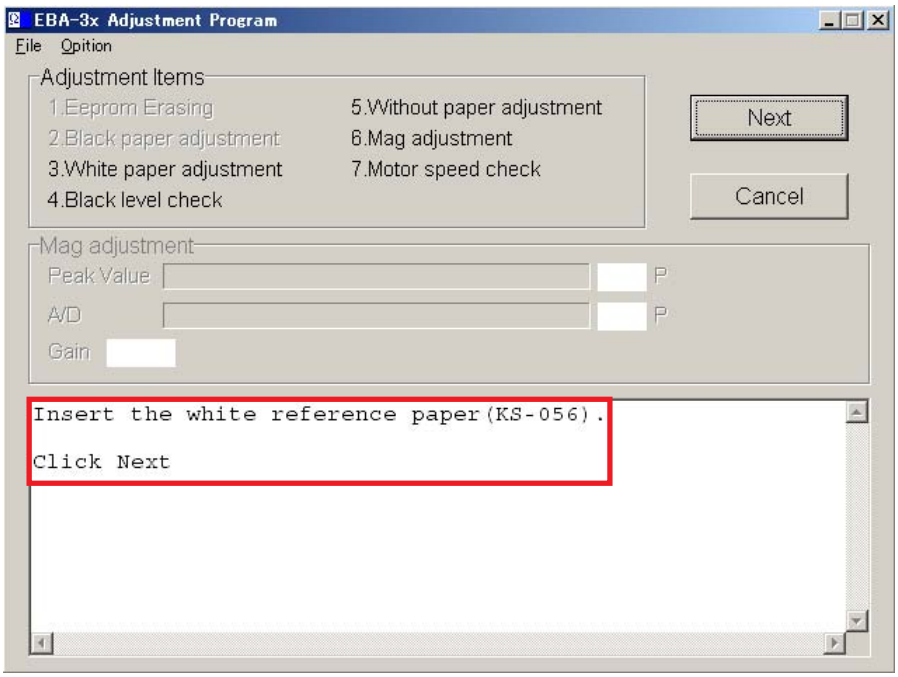
6) When completed the black papaer adjustment, the following message will appear (See Fig-30). Remove the black reference paper from the EBA-30/32/34 unit and then press[Next] button.

Fig-30



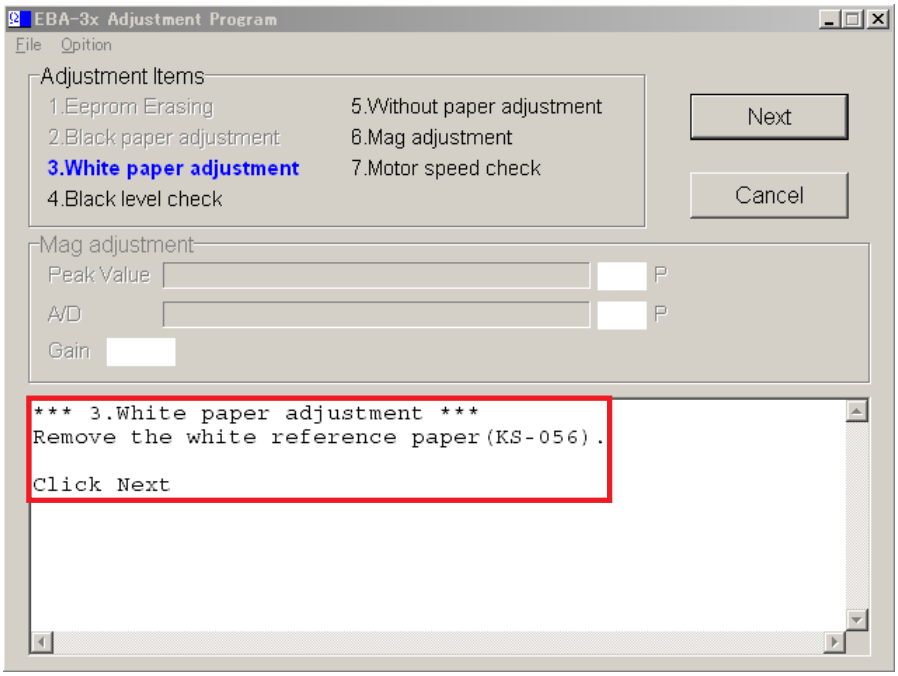
7) Then the following message will appear (See Fig-35). Insert the white reference paper to the EBA-30/32 /34 unit and then press the [Next] button to start the White paper adjustment.

Fig-31



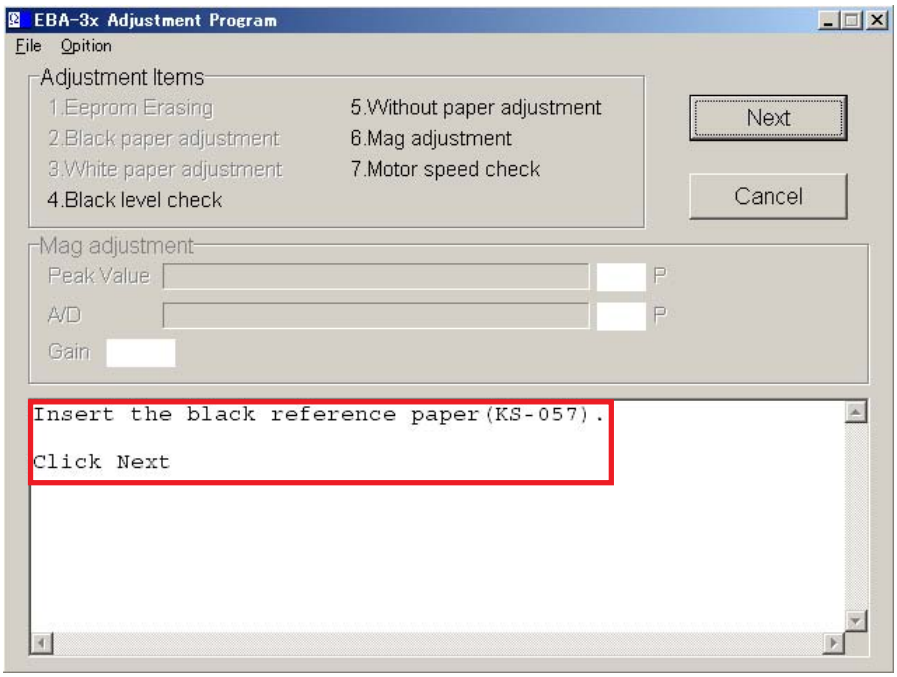
8) When completed the White paper adjustment, the following window will appear (See Fig-34). Remove the white reference paper form the EBA-30/32/34 unit and then click [Next] button.

Fig-32



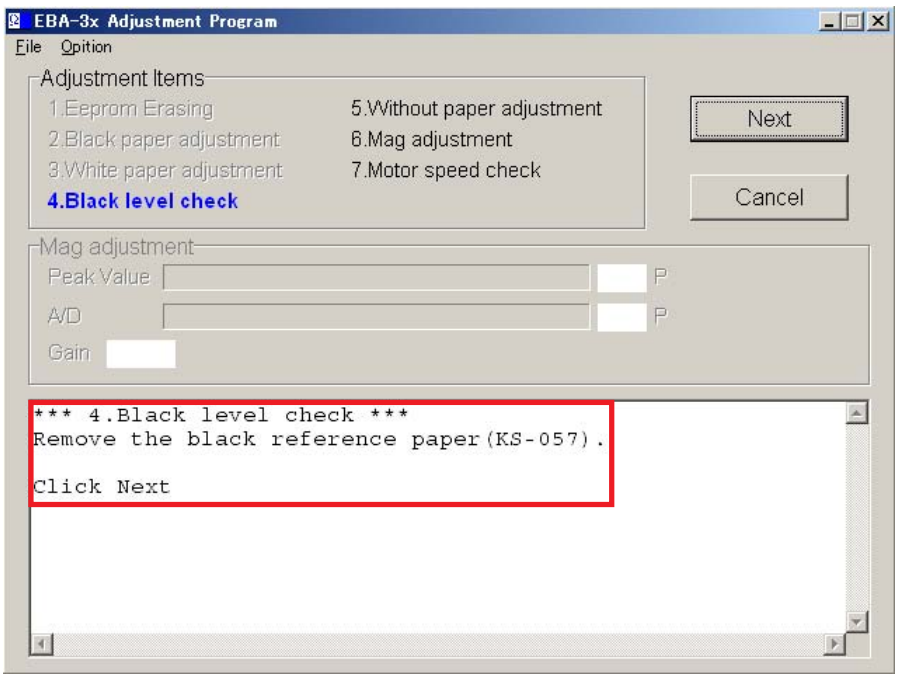
9) Then the following message will appear (See Fig-33). Insert the black reference paper to the EBA-30/32/34 unit and then press the [Next] button to start the Black level check.

Fig-33



10) When complete the Black level check, the following message will appear (See Fig-34). Remove the black reference paper from the EBA-30/32/34 unit and close the acceptor head cover properly. Then click [Next] button to start Without paper adustment.

Fig-34



11) When completed the Without paper adjustment, the following message will appear (See Fig-35). Then supply the power to the mag tool and insert the mag board to the EBA-30/32/34 unit (See Fig-36). Then press [Next] button to start the Mag adjustment.

Fig-35

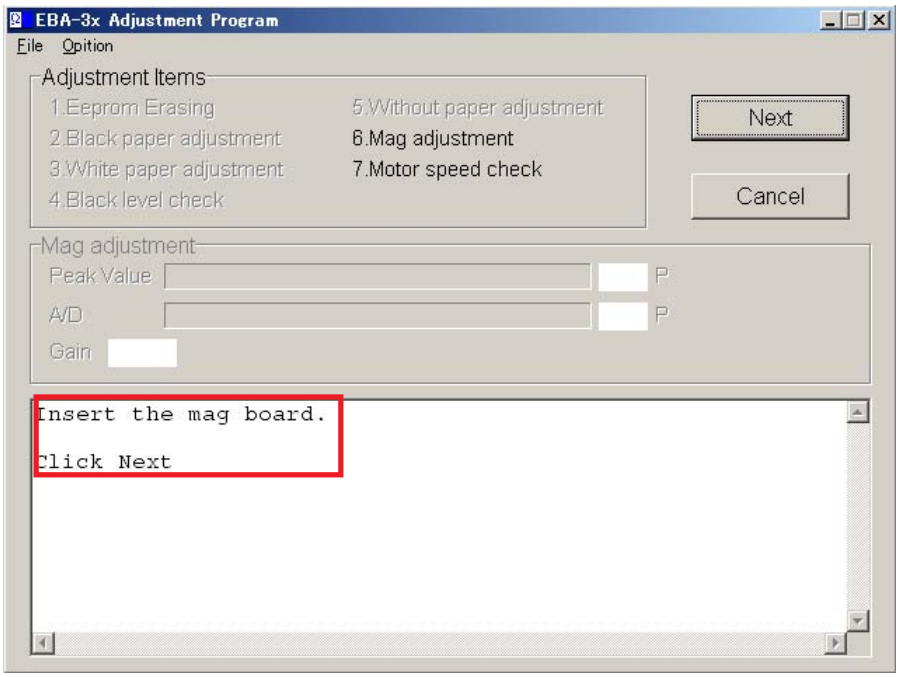
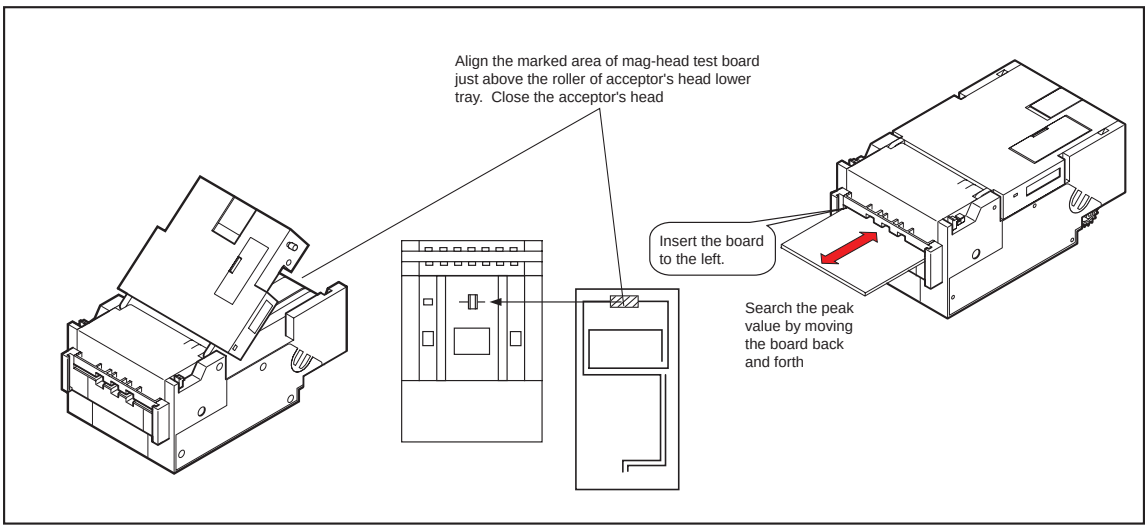
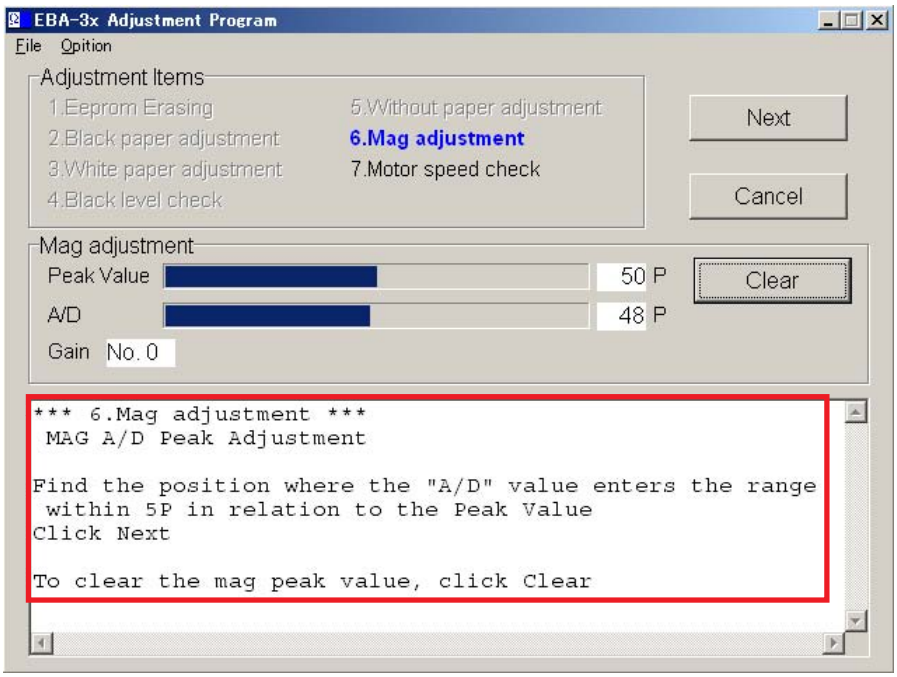


Fig-36


Align the marked area of mag-head test board just above the roller of acceptor's head lower tray. Close the acceptor's head
Insert the board to the left.
Search the peak value by moving the board back and forth

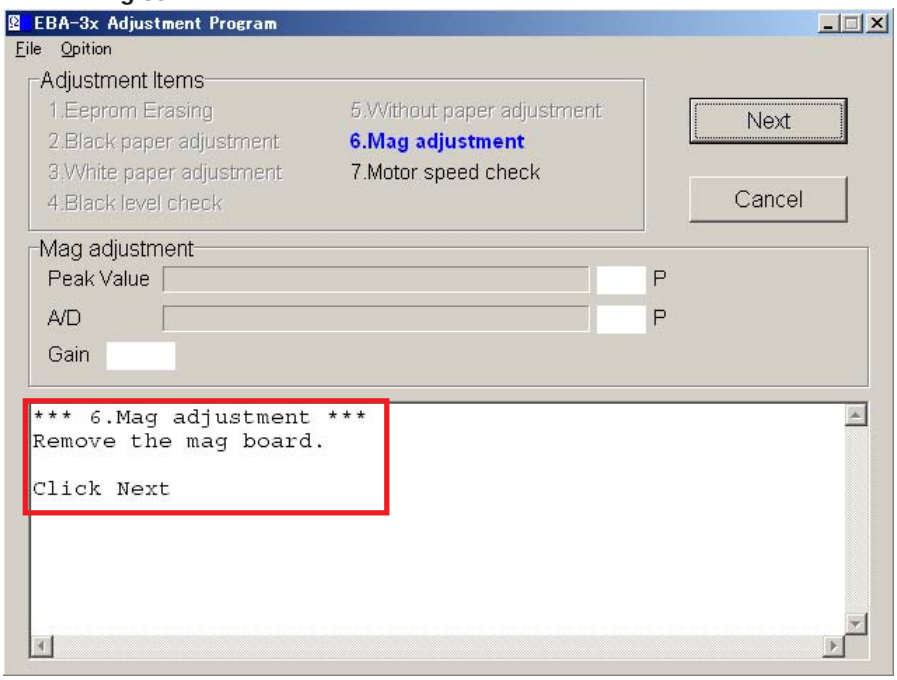
12) Then the following message will appear (See Fig-37). Slowly move the mag board back and forth to find the position where the “A/D” valu enters the rage within 5P in relation to the Peak Value. Then press the [Next] button to start the Mag adjustment.

Fig-37



13) When completed the Mag adjustment, the following message will appear (See Fig-38). Then remove the mag board from the EBA-30/32/34 unit and press [Next] button.

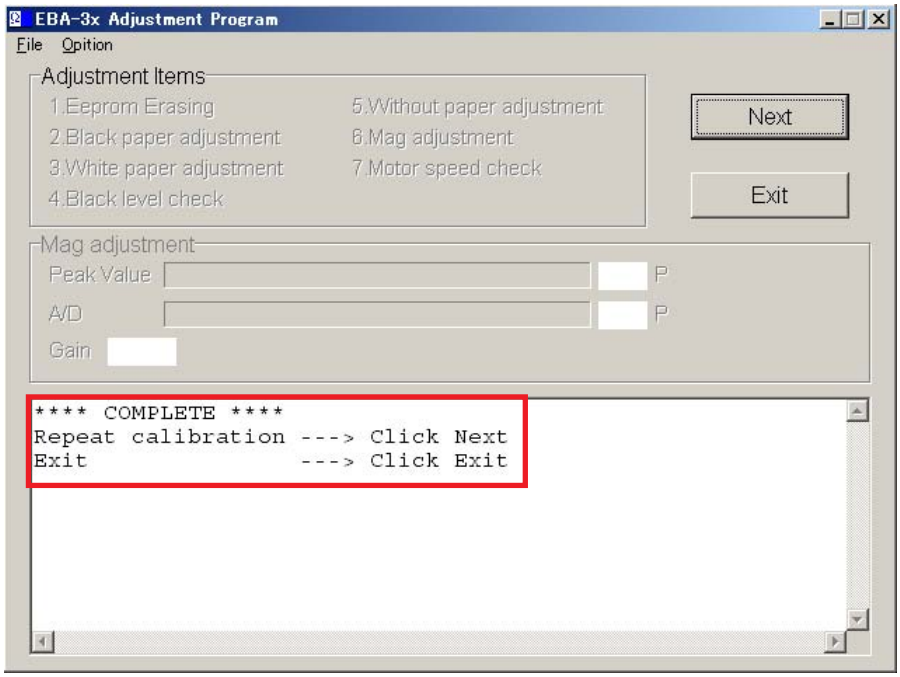
Fig-38



14) Then the Motor speed check will start.

15) When completed the Motor speed check, the following message will appear (See Fig-39). If you want to Then press adjust another EBA-30/32/34 unit, Press [Next] button. If you want to finish the adjustment, press [Exit] button to close the window.

Fig-39



3. Downloading software to Flash Memory

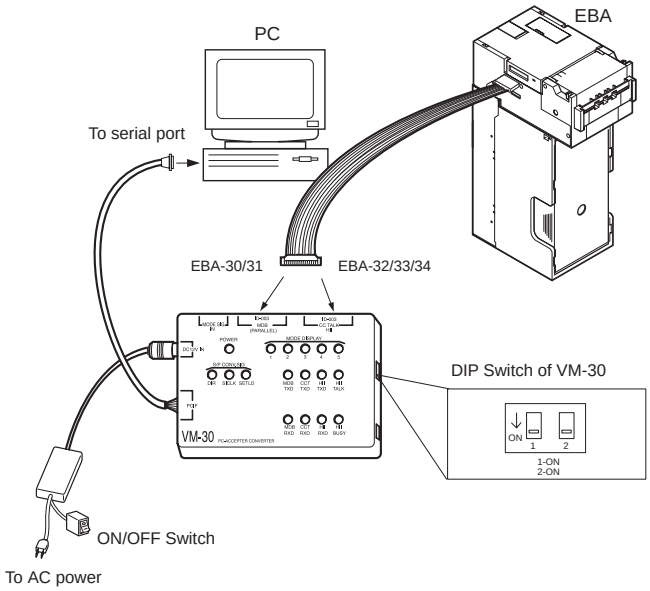
This section describes how to download software program to flash memory of CPU board.

WHEN TO DOWNLOAD

- Software upgrade
- After CPU board is replaced.

3-1 Connecting PC and VM-30 with EBA (Fig-40).

Fig-40



Connection of EBA with VM-30
(if the CPU board is EBA-30/31/34, connect to ID-003/MDB socket, and
if the CPU board is EBA-32/33, connect to ID-003/ccTalk/HII socket.)

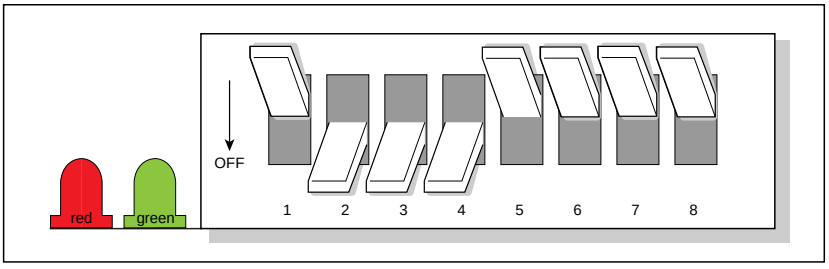
3-2 Setting EBA to download mode

(1) Confirm the power of VM-30 and/or host machine is OFF when connecting the cable to EBA.
Failure to do so may cause electric shock and/or permanent damage to the equipment.

(2) Set DIP Switch 1 #1 and #5-8 ON, and #2-4 OFF.
Set both DIP switches of VM-30 ON.
The baud rate is set to 38400bps. For other baud rate settings, see page 7-19.

(3) Supply power to the unit.

Fig-41



3-3 Starting the download program

There are 3 ways to start the EBA download program.

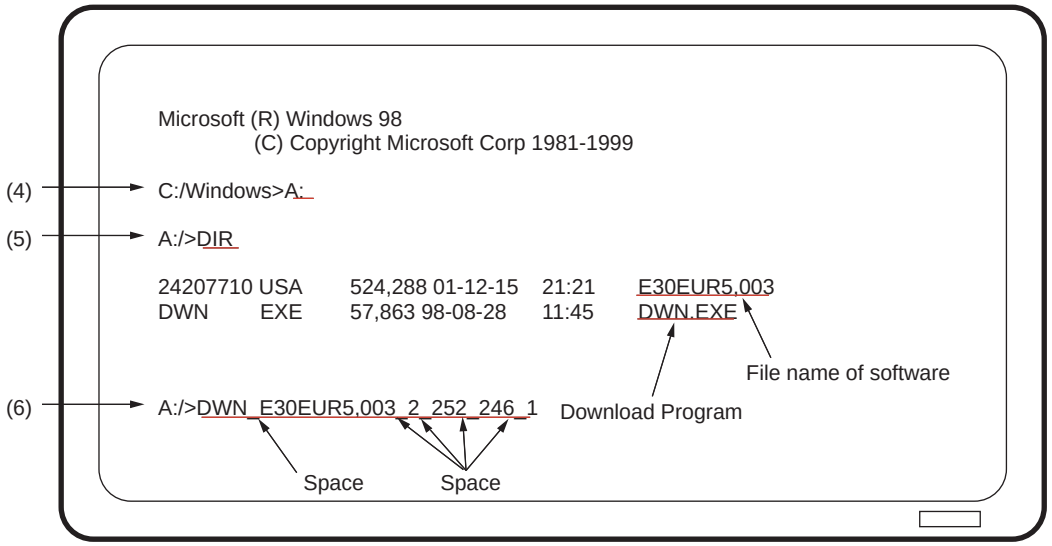
A] When using the DWN.exe on MS-DOS

1) Turn on the PC.
2) Insert the FD (floppy disk) saved the download program (DWN.exe) to PC's FDD (floppy disk drive).
3) Start MS-DOS (see your PC and MS-DOS manuals to find out how to start MS-DOS).
4) After MS-DOS menu appears, input "A" (when your FD is in "A" drive) and press "Enter".
5) Input "DIR" and press [Enter]. The list of file names in FD appears.
6) Find the file name of software and enter the parameters as shown in the diagram below.

B] When using the DWN.exe on Windows98/Me/2000/XP)

1) Turn on the PC and start Windows98/Me/2000/XP
2) Insert the FD (floppy disk) containing the download program to PC's FDD (floppy disk drive).
3) Start MS-DOS prompt or Command prompt from START menu of Windows.
4) When MS-DOS/Command prompt menu appears, input "A:" (when your FD is in "A" drive) and press [Enter].
5) Input "DIR" and press [Enter]. The list of file names in the FD appears.
6) Find the file name of software and enter the parameters as shown in the diagram below (Fig - 42). Press [Enter].

Fig-42



Explanation of Parameters: DWN [File name][baud rate][address][size][port] Enter.

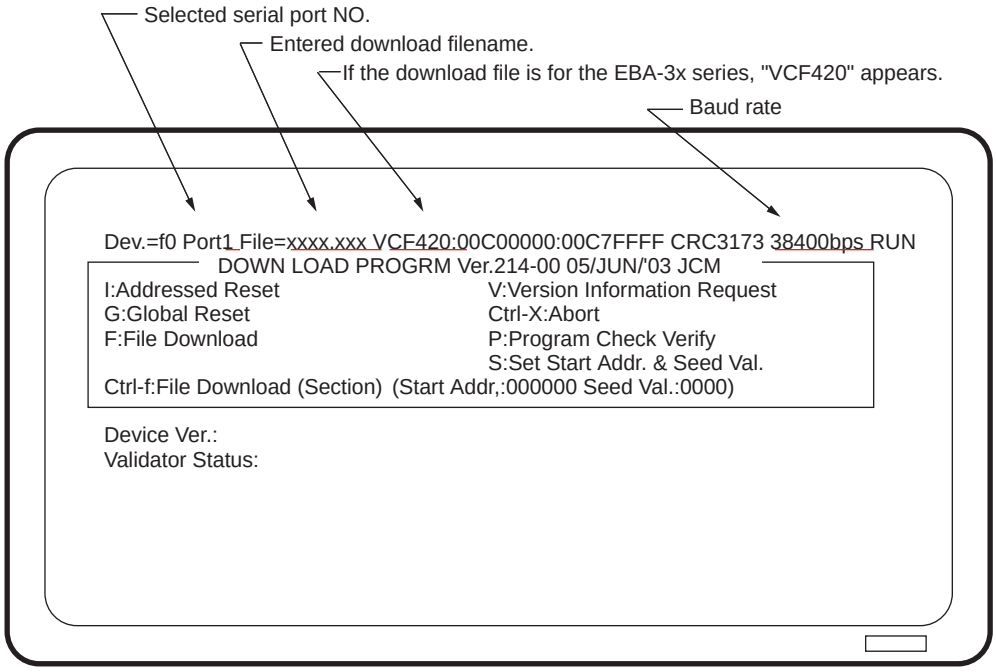
[File name]	Download file name	(must be specified)
[baud rate]	0: 9600bps 1: 19200bps 2: 38400bps	Default:0
[address]	Fixed at 252 (FC hex.).	Default:252
[size]	Fixed at 246.	Default:246
[port]	Serial port number	Default:1

• (1) Execution Monitor

1)When the program starts, the following monitor appears.

Note: If the download file is correct, "VCF420" appears on the top line (See Fig-43).

Fig-43



(2) Commands:

Use letter keys to enter a command.

I: Addressed Reset - Reset a selected unit in the machine.

V: Version Information Request - Read the program version after downloading completed.

G: Global Reset - Reset all the units (including EBA) connected to the machine.

[Ctrl]-x:Abort - Exit the program

F: File Download - Download the specified file.

P: Program Check Verify - Check CRC by EBA itself.

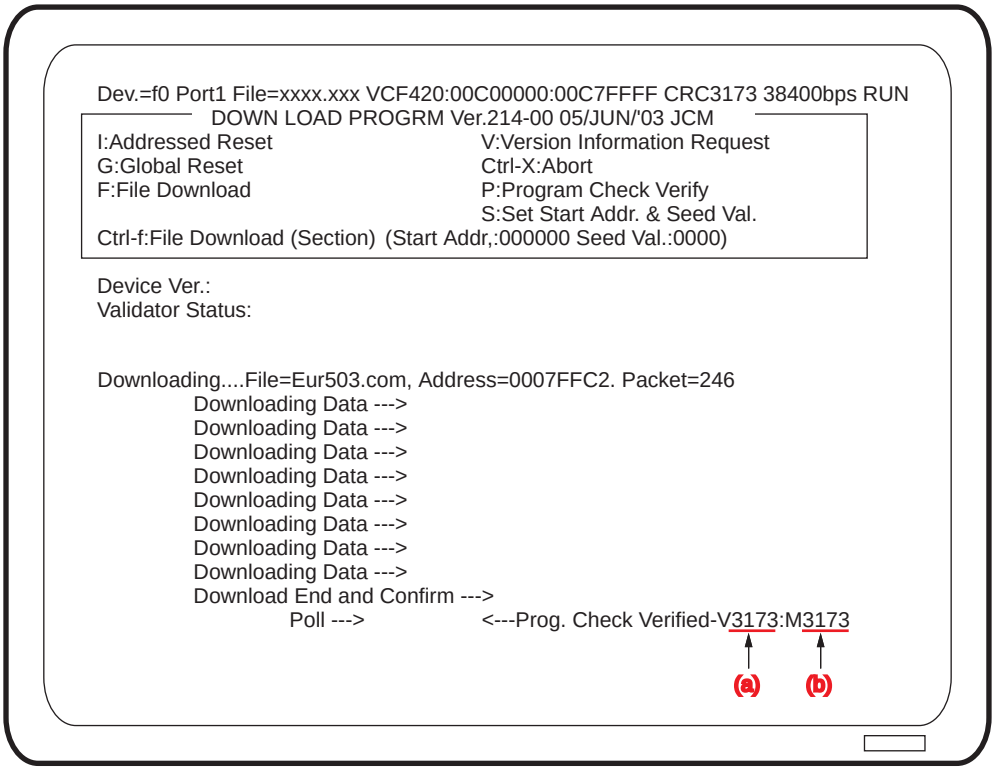
[Ctrl]-f:File Download (Selection) - DO NOT USE THIS COMMAND!

S: Set Start Addr. & Seed Val. - Set the start address and initial value of CRC when checking CRC.

(3) Downloading:

1) Press [Shift]-F (capital letter) to start downloading the program.
2) Downloading starts. Both red and green LEDs of CPU board blink alternately.
3) When the downloading is complete, LEDs blink in unison.
4) "CRC" appears on the monitor (See Fig-44).

Fig-44



(a) V****: CRC value calculated by EBA

(b) M****: CRC value calculated by PC

If the downloading is successful, CRC values of (a) and (b) should be the same.

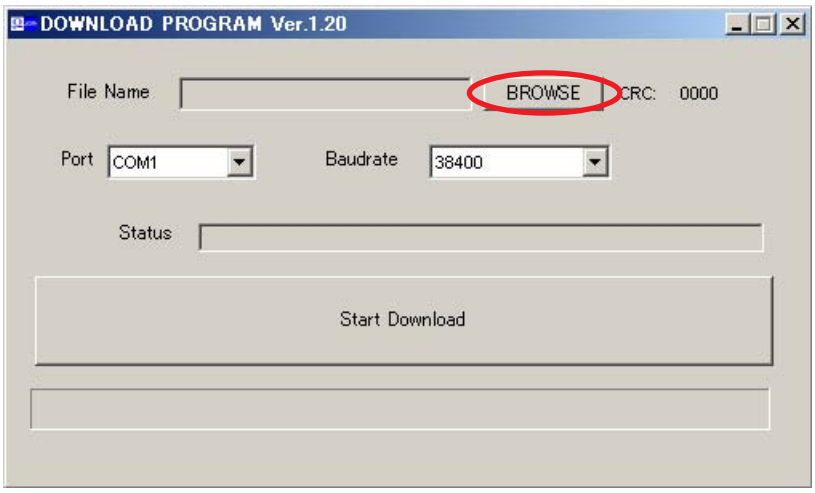
5) After the downloading is complete, press [Shift]-V (capital letter) to verify the update if necessary.
6) Exit the program ([Ctrl]-x).

Reference:"CRC" is an error correction method for checking whether or not data is correctly transmitted.

C] When using DOWNLOAD(V*).exe**

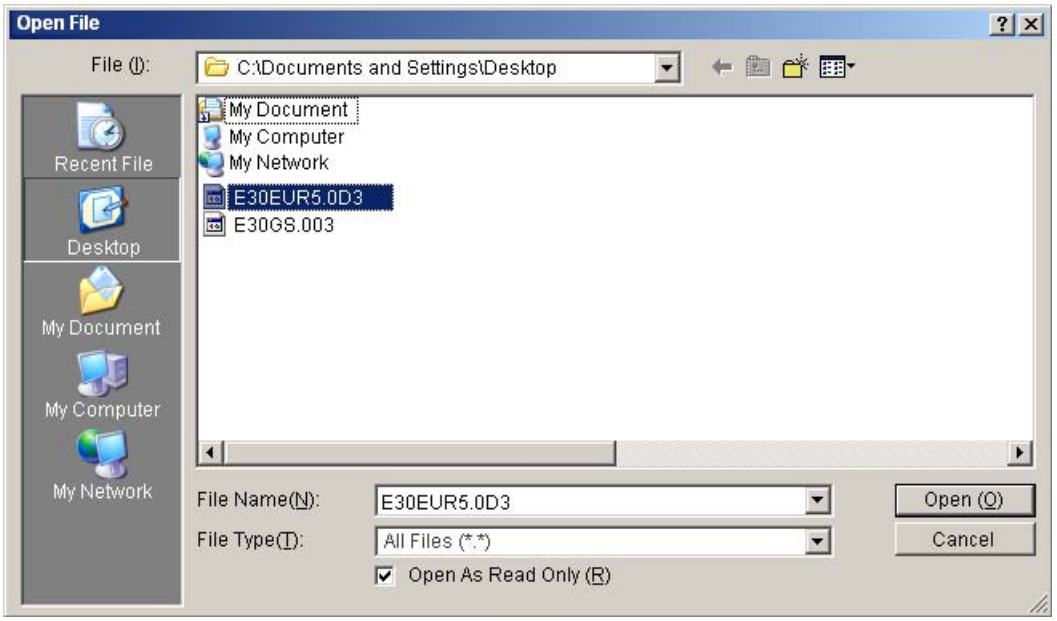
1) Double click the DOWNLOAD(V***).exe and then following the screen will appear (See Fig-45).

Fig-45



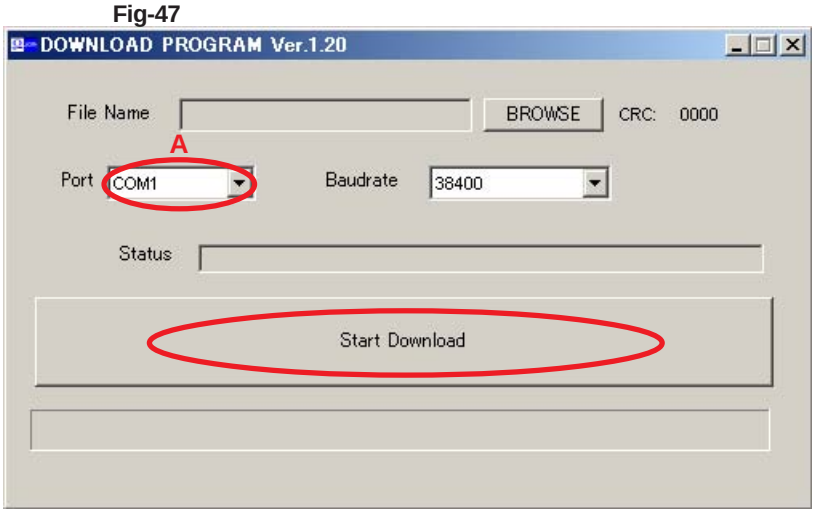
2) Press the [BROUSE] button and then the Open File Window will appear (See Fig-46). Select the software you want to download.

Fig-46



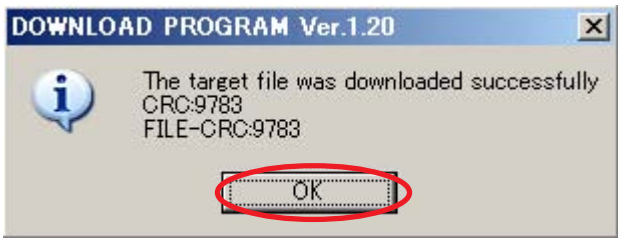
3) Select your PC's COM Port No. from A and then Press the [Start Download] button (See Fig-47).

Fig-47



4) When the downloading is completed, the following message will appear.
5) Press [OK] button to close the message (See Fig-48).

Fig-48



4. Writing Serial Number (for ID-0E3 only)

WHEN TO WRITE SERIAL NUMBER

- When you replace the current CPU board with a new EBA-32/33 CPU board, and then install new ccTalk interface software

(No need to write Serial Number when replacing with EBA-30/31 CPU board, or installing other interface software)

Note:

* *Write your serial number to EEPROM before downloading/installing software, otherwise communication with host machine cannot be established.*

* *In case of exchanging the lower sensor board, you do not need to write Serial Number.*

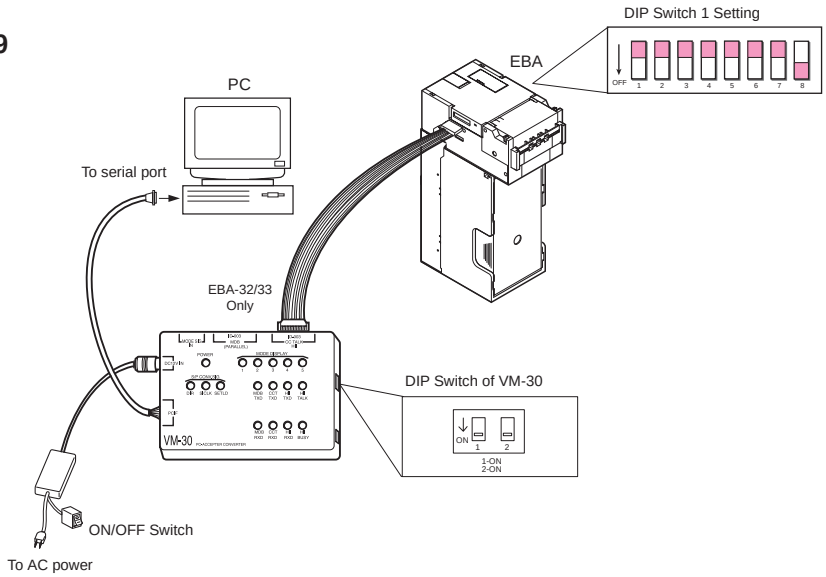
* *After calibration, you do not need to write Serial Number as the serial number is saved in Acceptor's memory.*

TOOLS NEEDED:

- PC (with serial port)
- VM-30 I/F Test Bench
- Programs:

E10S-100exe and Dosvga.bgi (MS-DOS/Windows98/2000/ME/XP)
(Note: save these two files in the same directory, otherwise E10S-100.exe cannot be started.)
AdjMenu.exe (Windows98/2000/XP)

Fig-49



4-1 Steps for writing your serial number to EEPROM (NV memory)

There are 3 ways to start the EBA download program.

A] When using the E10S-100.exe on MS-DOS

1) Start MS-DOS. See your PC and MS-DOS manuals to find out how to start MS-DOS.
2) Insert a floppy disk containing E10S-100.exe and Dosvga.bgi to your PC's floppy drive.
3) Change the current drive to the drive in which you have inserted the floppy disk (if it is A drive, enter A.)
4) To start writing the serial number, input "E10S-100.exe" and press [Enter].

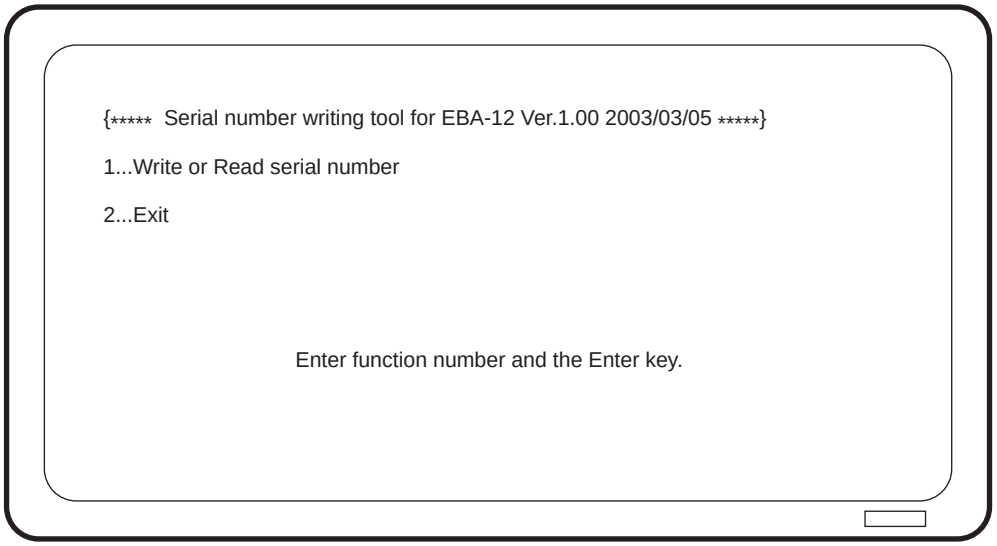
B] When using E10S-100.exe on Windows98/2000/ME/XP

1) Copy the E10S-100.exe and Dosvga.bgi to your PC.
2) Start the program E10S-100.exe by double-clicking the file.

Start writing the serial number

(1) Input "1" and press [Enter].

Fig-50

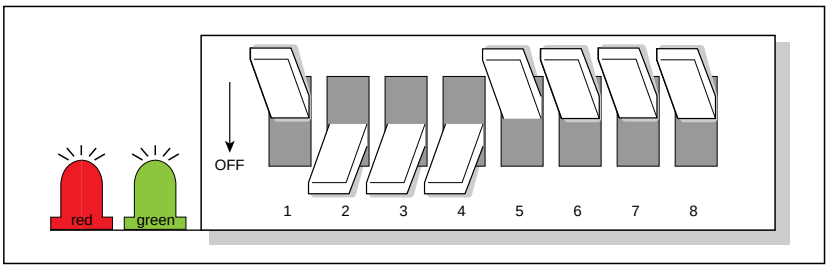

{***** Serial number writing tool for EBA-12 Ver.1.00 2003/03/05 *****}
1...Write or Read serial number
2...Exit
Enter function number and the Enter key.

(2) Connect EBA with PC and VM-30 (See Fig-49).
(At the time of connection, VM-30 power switch is to be OFF and DIP switches #1 & #2 are to be ON.)

(3) Set DIP switches #1-7 to ON and #8 to OFF.

(4) Turn on the power switch of VM-30.

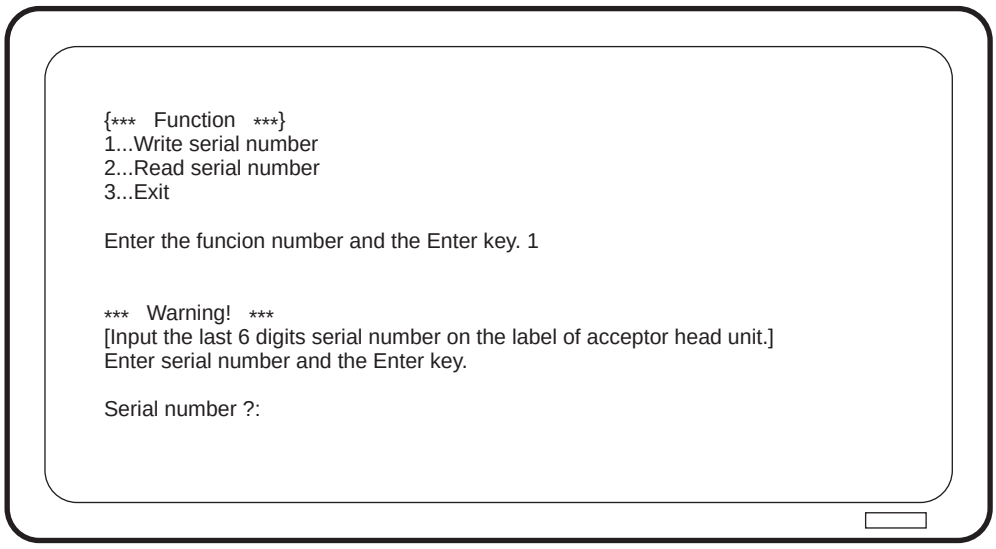
(5) Confirm the red and green LEDs on the CPU board light. Turn off DIP switch #1. Both LEDs turn off.



(6) Input "1" and press [Enter].

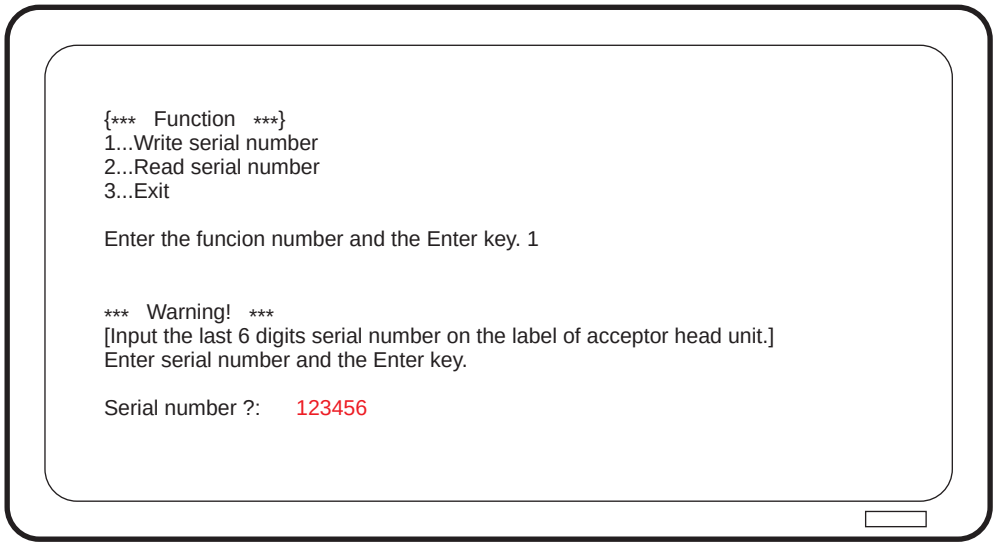
(7) Input the last 6 digits of serial number on the label of acceptor's head unit and press [Enter].

Fig-51


{*** Function ***}
1...Write serial number
2...Read serial number
3...Exit
Enter the funcion number and the Enter key. 1
*** Warning! ***
[Input the last 6 digits serial number on the label of acceptor head unit.]
Enter serial number and the Enter key.
Serial number ?:

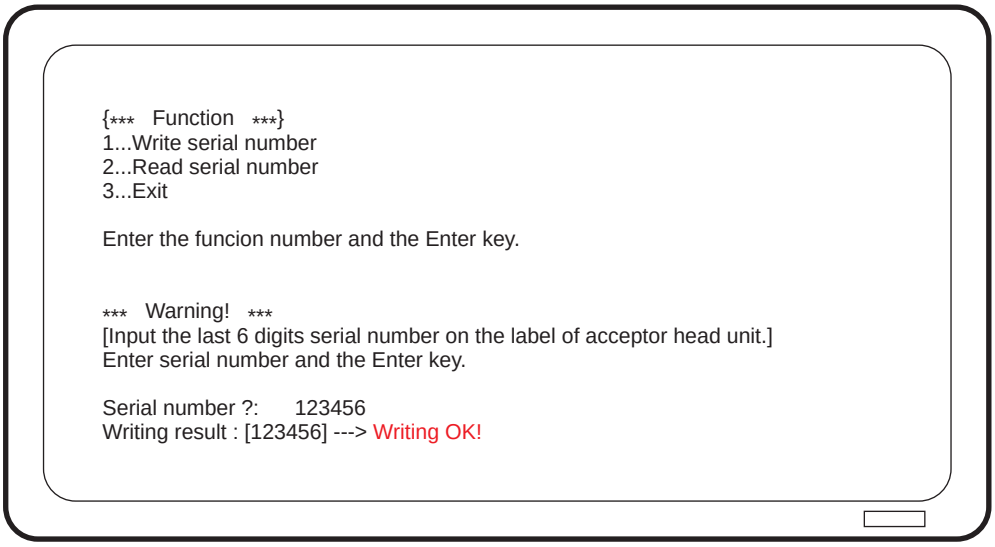
(Make sure to input the serial number of acceptor's head unit, not the number of SD3 stacker unit. Communication with host machine cannot be established with wrong serial number input.)

Fig-52


{*** Function ***}
1...Write serial number
2...Read serial number
3...Exit
Enter the funcion number and the Enter key. 1
*** Warning! ***
[Input the last 6 digits serial number on the label of acceptor head unit.]
Enter serial number and the Enter key.
Serial number ?: 123456

When your serial number is written successfully, "Writing OK" appears (See Fig-53).

Fig-53


{*** Function ***}
1...Write serial number
2...Read serial number
3...Exit
Enter the funcion number and the Enter key.
*** Warning! ***
[Input the last 6 digits serial number on the label of acceptor head unit.]
Enter serial number and the Enter key.
Serial number ?: 123456
Writing result : [123456] ---> Writing OK!

(8) Confirm the high-speed blinks on the LEDs of CPU board.
The serial number writing is complete.
Turn off the power of VM-30.

To write serial number to other EBA(s), repeat the steps (3) to (9) above.
To exit from the program, input "3" (Exit) on each menu.
When the serial number is written in the acceptor, make sure to input the same number to the host machine.
If the numbers of acceptor and host machine are different, communication with ccTalk protocol can not be established.

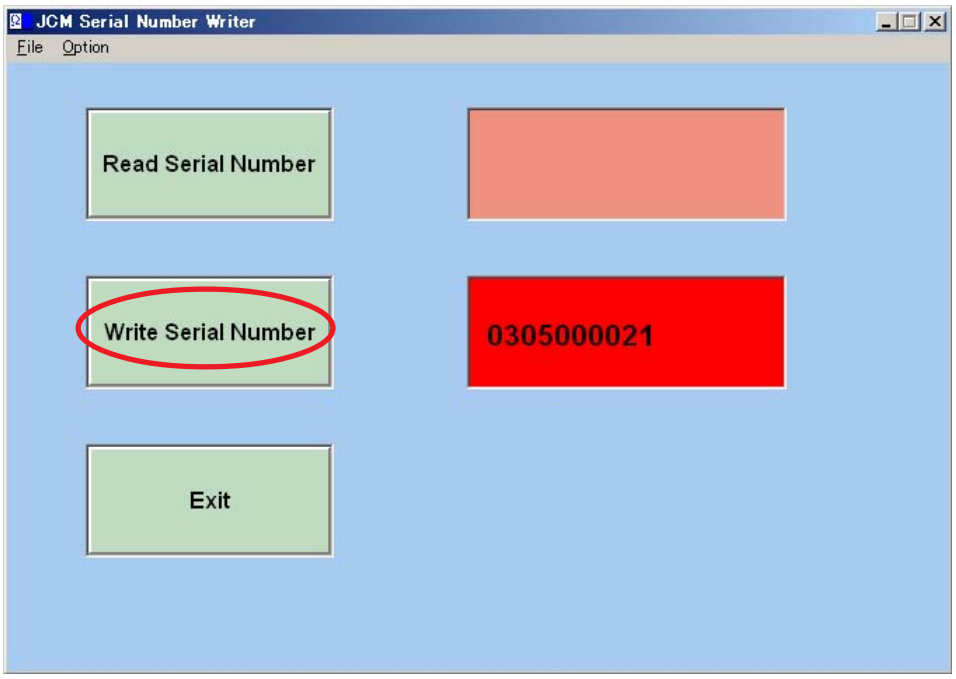
C] When using the AdjMenu.exe on Windows98/2000/XP.

1) Start Windows98/2000/XP.
2) Double click AdjMenu.exe to start the calibration program. Then the following window (Fig-54)will appear. Click the [Serial Number Writer] button.

Fig-54

3) Then the following window (Fig-55) will appear. Enter the your EBA-32/33 unit's serial number and press [Write Serial Number] button.

Fig-55



5. Diagnostics

Refer to Chapter 6, page 6-2 for appropriate cabling between EBA and VM-30.

To execute test modes, turn the power switch OFF, set the switch #1 of DIP switch 1 (see Chapter 1 page 1-4, Component Names) to ON, and then turn the VM-30 power ON. The red and green LEDs of CPU turn on, indicating the acceptor is in stand-by status.
Each test mode is selected by the assignment of DIP switches #2 to #8, and is executed by turning DIP switch #1 OFF. Turn DIP switch #1 ON to exit the test mode (i.e. return to the stand-by status of the test mode).

5-1 List of the DIP switch settings and the test mode items

DIP SWITCH No. 1 2 3 4 5 6 7 8	ITEM	DESCRIPTION
	Transport motor normal rotation test	Transport motor speed test (normal rotation)
	Transport motor reverse rotation test	Transport motor speed test (reverse rotation)
	Acceptor sensor ON/OFF test #1	Bill detection sensor test
	Acceptor sensor ON/OFF test #2	Validation sensor test
	Acceptor sensor ON/OFF test #3	Validation sensor test
	Acceptor sensor ON/OFF test #4	Validation sensor test
	Acceptor sensor ON/OFF test #5	Validation sensor test
	Acceptor I/F test (OUT)	External display output cirucit test
	Acceptor I/F test (IN)	External display input cirucit test
	Acceptor bill acceptance test	Bill acceptance and operation test
	Acceptor+stacker bill acceptance test	Bill acceptance and operation test
	PB unit test	PB unit and PB unit home sensor test
	Centering mechanism test	Centering mechanism and the home position sensor test
	Solenoid test	Solenoid lever ON/OFF test
	Stacker sensor test	Stacker sensor test
	Stacker stacking test	Stacker pusher mechanism check and stacker sensor test
	Acceptor+stacker aging test	Acceptor unit + stacker unit operation test
	Acceptor aging test	Acceptor unit operation test

DIP SWITCH No. 1 2 3 4 5 6 7 8	ITEM	DESCRIPTION
	Forced download master mode	19200bps
	Forced download master mode	38400bps
	Encryption code initialization	Initializing the encryption code (used in ID-0E3) to the default value
	Serial number writing	Writing serial number to the acceptor's EEPROM
	Forced download slave mode	9600bps
	Forced download slave mode	19200bps
	Forced download slave mode	38400bps
	DIP switch test #1	Dip Switch 1, switches #2-#4 ON/OFF check
	DIP switch test #2	Dip Switch 1, switches #5-#8 ON/OFF check
	DIP switch test #3	Dip Switch 2, switches #1-#4 ON/OFF check
	DIP switch test #4	Dip Switch 2, switches #5-#8 ON/OFF check

5-2 Test of normal rotation & reverse rotation of transport motor in Acceptor

The test result is shown on acceptor's LEDs (red & green) and the VM-30 mode display LED1 to LED5.

For testing with Acceptor's head unit only, set DIP switch #8 ON after the test mode is started.

(Acceptor's LED indication)

Red LED "ON": out of range ±20% of reference value

Green LED "ON": within range ±20% of reference value

(VM-30 Mode Display LED)

	LED1	LED2	LED3	LED4	LED5
Less pulse count (slow)	✸	○	○	○	○
Less pulse count (slow)	○	✸	○	○	○
Pulse count in 1 secound is within (+-)20% of reference value	○	○	✸	○	○
More pulse count (fast)	○	○	○	✸	○
More pulse count (fast)	○	○	○	○	✸

5-3 Acceptor bill detection sensor ON/OFF test

The test result is shown on the acceptor's LEDs (red & green) and the VM-30 mode display LED1 to LED5.

(1) Test#1: The test of bill detection sensors

	Detecting Bill	Detecting No Bill
Entrance Sensor	LED1: ✸	LED1: ○
Centering Timing Sensor	LED2: ✸	LED2: ○
Back Sensor	LED3: ✸	LED3: ○
Head Exit Sensor	LED4: ✸	LED4: ○

(2) Test#2: The test of bill detection by acceptor's validation sensors

	Detecting Bill	Detecting No Bill
CL3R Sensor	LED1: ✸	LED1: ○
CL3I Sensor	LED2: ✸	LED2: ○
AL2I Sensor	LED3: ✸	LED3: ○
BL2G Sensor	LED4: ✸	LED4: ○

(3) Test#3: The test of bill detection by acceptor's validation sensors

	Detecting Bill	Detecting No Bill
AL1R Sensor	LED1: ✸	LED1: ◯
BL1I Sensor	LED2: ✸	LED2: ◯
AR1R Sensor	LED3: ✸	LED3: ◯
BR1I Sensor	LED4: ✸	LED4: ◯

(4) Test#4: The test of bill detection by acceptor's validation sensors

	Detecting Bill	Detecting No Bill
AR2I Sensor	LED1: ✸	LED1: ◯
BR2G Sensor	LED2: ✸	LED2: ◯
BR3R Sensor	LED3: ✸	LED3: ◯
CR3R Sensor	LED4: ✸	LED4: ◯

(5) Test#5: The test of bill detection by Acceptor's validation sensors

	Detecting Bill	Detecting No Bill
CC0I Sensor	LED1: ✸	LED1: ◯
DC0G Sensor	LED2: ✸	LED2: ◯
SSP Sensor	LED3: ✸	LED3: ◯

5-4 Acceptor Interface Output Test

This is the test of output signal line from the acceptor to external I/F port and VM-30 mode display LED. This is also the output test of red and green LEDs of acceptor.

(1) EBA-30/31 CPU board

	VM-30 LED
DIR	Repeat blinking by 200ms in sequence from DIR=>SICLK=>SETLD=>DIR,SICLK,SETLD.
SICLK	
SETLD	
MDB TXD	Repeat blinking by 200ms.
Mode display LED1 to LED5	Repeat blinking by 200ms in sequence from LED1 to LED5.

(2) EBA-32/33 CPU board

	VM-30 LED
CCT TXD	Repeat blinking by 200ms in sequence from CCT TXD=>HII TXD=>HII TALK.
HII TXD	
HII TALK	
Mode display LED1 to LED5	Repeat blinking by 200ms in sequence from LED1 to LED5.

5-5 Acceptor Interface Input Test

This is the test of acceptor's input signal line (external I/F port). The status of the input signal line is shown on the VM-30 mode display LEDs.

(1) EBA-30/31 CPU board

	"ON" condition of Mode Display LED	"OFF" condition of Mode Display LED
MDB RXD	LED1 turns "ON", when MDB RXD of VM-30 switched to "ON"	LED1 turns "OFF", when MDB RXD of VM-30 switched to "OFF"

(2) EBA-32/33 CPU board

	"ON" condition of Mode Display LED	"OFF" condition of Mode Display LED
CCT RXD	LED1 turns "ON", when CCT RXD of VM-30 switched to "ON"	LED1 turns "OFF", when CCT RXD of VM-30 switched to "OFF"
HII RXD	LED2 turns "ON", when HII RXD of VM-30 switched to "ON"	LED2 turns "OFF", when HII RXD of VM-30 switched to "OFF"
HII BUSY	LED3 turns "ON", when HII BUSY of VM-30 switched to "ON"	LED3 turns "OFF", when HII BUSY of VM-30 switched to "OFF"

5-6 Bill Acceptance Test of Acceptor & Acceptor+Stacker

The denomination of bill received is shown on the Mode Display LED1 to LED5.

(VM-30 Mode Display LED: ex. Euro bills)

	LED1	LED2	LED3	LED4	LED5		LED1	LED2	LED3	LED4	LED5
5 €	✸	○	○	○	○	100 €	✸	○	✸	○	○
10 €	○	✸	○	○	○	200 €	○	✸	✸	○	○
20 €	✸	✸	○	○	○	500 €	✸	✸	✸	○	○
50 €	○	○	✸	○	○						

5-7 PB Unit Test

This is the test of PB unit operation. PB unit is cycled sequentially in certain intervals.

(VM-30 Mode Display LED1)

Condition of the Home Sensor	LED1
The home sensor is interrupted (PB unit is in the home position).	✸
The home sensor is not interrupted (PB unit is not in the home position).	○

5-8 Centering Mechanism Test

This is the test of acceptor's centering mechanism. The centering mechanism is operated sequentially in certain intervals. Do not stop this test when the centering mechanism is not in the home position, otherwise the acceptor's head cannot be opened (orange LED on the CPU board turns on when the centering guide is in the home position).

If the front cover of acceptor head became unable to be opened, use a hexagon-head screwdriver on the side hole of acceptor to reposition the centering guides to the home position (see Chapter 2, page 2-20).

(VM-30 Mode Display LED1 and orange LED on Acceptor's CPU board)

Condition of the Home Sensor	LED1 / orange LED
The home sensor is interrupted (Centralization mechanism is in the home position).	✸ ✸
The home sensor is not interrupted (Centralization mechanism is not in the home position).	○ ○

5-9 Solenoid Test

This is the test of solenoid lever operation. The solenoid lever moves in certain intervals.

(VM-30 Mode Display LED1)

Condition of the Home Sensor	LED1
The home sensor is interrupted (Solenoid lever is in the home position).	✸
The home sensor is not interrupted (Solenoid lever is not in the home position).	◯

5-10 Stacker Sensor Test

This is the test of sensor in SD3 stacker unit. The communication with stacker board is displayed on green LED of acceptor unit.

(VM-30 Mode Display LED)

	"ON" condition of Mode Display LED	"OFF" condition of Mode Display LED
Stack in Sensor	LED1 turns "ON", when detecting bill.	LED1 turns "OFF", when detecting no bill.
Stacker Box Detection Sensor	LED2 turns "ON", when detecting no stacker box.	LED2 turns "OFF", when detecting no stacker box.
Key Switch	LED3 turns "ON", when detecting key lock.	LED3 turns "OFF", when detecting release of key lock.
Pusher mechanism home sensor	LED4 turns "ON", when detecting interruption of home sensor..	LED4 turns "OFF", when detecting no interruption.
Stacker motor encoder sensor	LED5 turns "ON", when detecting interruption of the encoder sensor.	LED5 turns "OFF", when detecting no interruption of the encoder sensor.

(Green LED on the CPU board)

	"ON" condition of green LED (LD2)	"OFF" condition of green LED (LD2)
Communication with stacker board	Green LED turns "ON", during communication with stacker board.	Green LED turns "OFF", when stopping communication with stacker board.

Note:

When the communication with stacker board is normal, green LED blinks. When the communication error occurs, green LED is OFF.

5-11 Stacker Stacking Test

This is the test of stacker's stacking operation and the sensor performance. The pusher mechanism is operated in certain intervals.

5-12 Acceptor only or Acceptor+Stacker Aging Test

This is the test of Acceptor only or Acceptor+Stacker operation. When abnormal condition is detected, the unit stops and red LED blinks.

5-13 Master mode of forced download with baud rate 19200/38400bps

This is the download mode from EBA-30/32 to other EBA-30/32. The DIP switch setting of the slave unit needs to be forced download slave mode. When the downloading is complete, green LED blinks. After the downloading is complete, LED on Acceptor which received the software should be on the stand-by status.

5-14 Initialization of Encryption Code

This mode is to reset the encryption code used for ID-0E3 to the default value (i.e. initialization). When initialization is complete, green LED blinks.

5-15 Serial Number Writing

This mode is to write serial number from PC program. When the writing of Serial Number to EEPROM is complete, green LED blinks.

5-16 DIP Switches Test

This is the test of ON/OFF conditions of DIP Switch 1 and DIP Switch 2. The condition of each switch is shown on Mode Display LED1 to LED4.

(1) Test#1 (Dip Switch 1)

	Switch ON	Switch OFF
DIP switch 1 #1	------	------
DIP switch 1 #2	LED2: ✸	LED2: ○
DIP switch 1 #3	LED3: ✸	LED3: ○
DIP switch 1 #4	LED4: ✸	LED4: ○

Note:

Mode Display LED1 does not light as the execution of this test means Dip Switch 1 #1 works fine.

(2) Test#2 (Dip Switch 1)

	Switch ON	Switch OFF
DIP switch 1 #5	LED1: ✸	LED1: ◯
DIP switch 1 #6	LED2: ✸	LED2: ◯
DIP switch 1 #7	LED3: ✸	LED3: ◯
DIP switch 1 #8	LED4: ✸	LED4: ◯

(3) Test#3 (Dip Switch 2)

	Switch ON	Switch OFF
DIP switch 2 #1	LED1: ✸	LED1: ◯
DIP switch 2 #2	LED2: ✸	LED2: ◯
DIP switch 2 #3	LED3: ✸	LED3: ◯
DIP switch 2 #4	LED4: ✸	LED4: ◯

(4) Test#4 (Dip Switch 2)

	Switch ON	Switch OFF
DIP switch #2 #5	LED1: ✸	LED1: ◯
DIP switch #2 #6	LED2: ✸	LED2: ◯
DIP switch #2 #7	LED3: ✸	LED3: ◯
DIP switch #2 #8	LED4: ✸	LED4: ◯